GROUNDWATER ASSESSMENT
AND
VAPOR EXTRACTION FEASIBILITY STUDY
DIVERSEY WYANDOTTE CORPORATION
SANTA FE SPRINGS,
CALIFORNIA

Prepared for:

DIVERSEY WYANDOTTE CORPORATION

Prepared by:

THORNE ENVIRONMENTAL, INC.

DECEMBER 1989

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1.0 INTRODUCTION

Thorne Environmental, Inc. is pleased to present the results of our groundwater assessment and vapor extraction feasibility study at Diversey Wyandotte Corporation. The subject site is located at 8921 Dice Road in Santa Fe Springs, California, (Figure 1). This project was conducted in accordance with our proposal to Diversey Wyandotte dated October 19, 1989.

1.1 Previous Investigations

In June and September 1989, Thorne Environmental, Inc. conducted two separate subsurface investigations in the vicinity of the concrete sump area. A plot plan of this area is shown on Figure 2. After a shallow soil boring (SB-9) was drilled near the sump in June, two deeper soil borings (SB-11 and SB-12) were drilled in September 1989 to investigate subsurface soil conditions to a depth of approximately 46 1/2 feet below ground surface (bgs).

Tested soil samples obtained from SB-11 closest to the sump contained detected levels of kerosene and several volatile and semi-volatile organic compounds. Because these constituents were present in soil near groundwater, installation of a groundwater monitoring and vapor extraction well was recommended in Thorne's October 1989 report.

Logs of borings SB-9, SB-11 and SB-12 from the two previous investigations are presented in Appendix A (Plates 9, 11 and 12). A log of boring SB-19 (the groundwater monitoring and vapor extraction well) is presented on Plate 19.

2.0 PURPOSE AND SCOPE OF SERVICES

The purpose of installing a combined groundwater monitoring and vapor extraction well was twofold: first, to evaluate if groundwater was impacted by the chemical constituents in the vadose zone beneath the concrete sump; and second, to evaluate soil vapor characteristics during our vapor extraction feasibility study for purposes of designing a vapor extraction system (VES) for soil remediation.

The scope of our investigation involved the following tasks:

- Drill and install a groundwater monitoring/vapor extraction well to a depth of approximately 65 feet bgs;
- Develop the new groundwater monitoring well and the three older wells on-site;
- Sample and analyze groundwater from the four wells for total petroleum hydrocarbons (TPH) and volatile and semi-volatile compounds;

- o Measure and record groundwater levels in the four wells to evaluate groundwater flow direction and gradient across the site;
- o Evaluate groundwater test data;
- o Conduct a vapor extraction feasibility study on the vapor extraction well to evaluate soil vapor characteristics anticipated during soil remediation; and
- o Prepare this report presenting our findings, conclusions, and recommendations.

3.0 INVESTIGATIVE METHODS

3.1 Drilling and Sampling

The groundwater monitoring/vapor extraction well (SB-19) was drilled with a CME-75 truck-mounted hollow stem auger drill rig. The rig used 8-inch diameter auger and drilled to a depth of approximately 69 1/2 feet. All downhole equipment was steam cleaned prior to drilling the well. Soil cuttings from the well were placed in DOT-approved 55-gallon drums. The drums will be disposed at an appropriate landfill.

Soil samples were obtained at five foot intervals from 45 feet to 65 feet bgs for soil identification purposes. Because soils from 0 to 45 feet were sampled while drilling SB-11 in September 1989, no samples were obtained from this interval in SB-19. The samples were collected using a modified Sprague and Henwood split-spoon soil sampler. Sampling equipment was washed in tap water and Alconox solution and was double-rinsed in distilled water prior to sampling each interval. A key to Log of Borings and the Unified Soil Classification System is presented on Figure A-1.

The soil sampler contained three 6-inch long by 2 1/2-inch diameter brass tubes. The soils in the tubes and the cuttings from the well were screened for volatile organic compounds using a Photovac Tip-II photoionization detector (PID). The center tube of each sample was sealed with teflon, fitted with plastic caps, and sealed with tape. Samples were stored in a cooler with blue ice and were delivered to West Coast Analytical Services in Santa Fe Springs, California for chemical testing. Full chain-of-custody protocol was followed during sample delivery.

3.2 Groundwater Monitoring/Vapor Extraction Well Installation and Design

The well was completed using 4-inch I.D. Sch. 40 well casing and 4-inch I.D. 0.020-inch slotted Sch. 40 PVC well screen. Screen was set from approximately 10 feet to 69 1/2 feet bgs while the casing was set from the ground surface to 10 feet bgs. Threaded top and bottom caps were placed on the well casing and screen. The annulus opposite the well screen and the first two feet of well casing was packed with #3 Monterey sand. The remainder of the annulus opposite the well casing was filled

with concrete. The top of the well was covered with a water-tight steel fill-ring set in concrete two inches above ground surface. The edge of the well head was sloped down to the ground surface to provide drainage.

3.3 Groundwater Monitoring Well Development and Sampling

The four monitoring wells were developed using a submersible water pump. Approximately 100 gallons of groundwater was pumped from each well and was placed in DOT-approved 55-gallon drums. During well development, water temperature and electrical conductivity were monitored.

Groundwater samples were obtained from each well using a teflon bailer. The bailer was washed in a tap water and Alconox solution and double rinsed in distilled water between each sample. The sampled water was transferred to sterile 40 ml and 1 liter glass containers with accompanying duplicate samples. QA/QC samples were also taken between each well. The sample containers were filled with water to the top to expel air space and were tightly fitted with teflon-lined caps. Collected water samples were stored in a cooler with blue ice and were delivered to a DHS-certified chemical laboratory for analytical testing. Full chain-of-custody protocol was followed during sample delivery.

3.4 Soil and Groundwater Laboratory Analyses

Selected soil samples were analyzed for TPH using EPA Method 8015. Soil test results are presented in Table 1 and in Appendix B. Soil test results from SB-11 and SB-12, drilled and sampled in September 1989, are also shown in Table 1. Groundwater samples were tested for TPH using EPA Method 8015, volatile organic compounds by EPA Method 624, and for semi-volatile organic compounds by EPA Method 625. Groundwater test results are shown in Table 2 and in Appendix B.

3.5 Vapor Extraction Feasibility Test

A vapor extraction feasibility test was conducted on the vapor extraction well (SB-19) to evaluate the concentration, type and volume of soil vapors beneath the concrete sump area. A 92 cubic feet per minute (cfm) regenerative blower was attached to the top of the well. Soil vapors were extracted at a constant rate of 92 cfm from the well for approximately one hour. Vapor concentrations in parts per million were monitored using a PID. After one hour, approximately 10 liters of vapor were sampled with a SKC air sample tube. Two 10-liter samples were obtained. The sample tubes were then delivered to an analytical laboratory for testing to evaluate concentrations of TPH and volatile organic compounds. Vapor sample test results are presented in Table 4 and Appendix C.

4.0 FINDINGS- GROUNDWATER ASSESSMENT

4.1 Subsurface Conditions

Subsurface conditions at the concrete sump are based on soils encountered in soil boring SB-19. In general, soil types beneath the sump area appear to be uniform. The area is underlain by brown to reddish brown silty fine to medium sand and brown fine sandy silt to a depth of approximately 10 feet bgs. These soils are slightly moist and medium dense in consistency. Underlying the uppermost soils are slightly moist, dense, olive brown fine to coarse sands that extend to a depth of approximately 24 feet bgs. Soils below 24 feet bgs grade into reddish brown clayey to fine sandy silt. These soils extend to about 51 feet. A reddish brown silty clay layer is located from approximately 51 feet to 54 feet bgs. This layer is underlain by brown medium to coarse sand to the maximum depth explored of 69 1/2 feet bgs.

Groundwater was encountered in SB-19 (MW-4) at approximately 52 feet bgs. Table 3 lists the latest groundwater monitoring well data obtained on November 10, 1989. Groundwater flow across the site is directed to the west at a gradient of about 0.5 feet per 100 feet. No free product was observed on the groundwater in any of the wells.

4.2 Soil and Groundwater Test Results

Three soil samples from SB-19 at 50 feet, 55 feet and 60 feet bgs were analyzed for TPH using EPA Method 8015. No detected levels of TPH were present in the samples.

Groundwater samples obtained from MW-1, MW-3 and MW-4 did not contain detectable levels of TPH. The groundwater sample form MW-2 contained 7 milligrams per liter (mg/l)* of weathered gasoline.

As shown on Table 2, all groundwater samples contained several volatile organic and halogenated organic compounds at the part per billion level. Groundwater samples from MW-1 and MW-4 also contained one to two semi-volatile organic compounds at the part per billion level.

* One mg/l is approximately equal to one part per million (ppm)

5.0 DISCUSSION

Soil test results from the previous investigation in September 1989 showed that kerosene and several semi-volatile organic compounds were present in soils beneath the concrete sump form approximately 5 to 45 feet bgs. These results along with those of this study also indicated that kerosene had concentrated primarily in the top portion of the silt and clay layer located from about 45 feet to 54 feet bgs. This relatively impermeable layer has inhibited the migration of kerosene to the groundwater located at 54 feet bgs. This is supported by the groundwater test results. No TPH as kerosene were detected in any of the groundwater samples from the four wells.

The volatile organic compounds detected in the groundwater are halogenated solvents such as tetrachloroethylene, trichloroethylene, and 1,2-dichloropropane. Halogenated solvents are not presently used, stored or disposed on the site according to plant personnel.

The majority of the volatile organic compounds detected in the four wells are above California Department of Health Services (DOHS) action levels**, as shown in Table 2. No action levels exist for the semi-volatile organic compounds found in the groundwater. These compounds at these low concentrations are usually not regulated by the DOHS or the Regional Water Quality Control Board (RWQCB).

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Based on field and certified analytical data, the following conclusions can be made:

- The kerosene in the vadose zone beneath the concrete sump appears to be restricted to the soils above 45 feet bgs. Most of the high concentration of kerosene was contained in relatively lower permeable soils above the groundwater level.

- The subject property is located in a heavily industrialized area. Groundwater quality in the first aquifer beneath this area has been degraded by years of industrial activity. Detected constituents in the groundwater beneath the site may be a part of the background groundwater quality in the area. Halogenated solvent concentrations above 0.005 mg/l have been detected in groundwater from wells located in Santa Fe Springs.[1]

** The DOHS action level for groundwater is a concentration above which there is cause for concern and possible groundwater remediation.

[1] Metropolitan Water District, 1988, Groundwater Quality and Its Impact on Water Supply in the Metropolitan Water District Service Area, Report No. 969.

- o Diversey Wyandotte does not use or store halogenated solvents in its manufacture of industrial cleaning agents. Therefore, there is no evidence to suggest that the halogenated organic compounds present in groundwater beneath the site originated from a spill or leak on-site.

6.2 Recommendations

Thorne Environmental, Inc. recommends installing an off-site, upgradient groundwater monitoring well to monitor upgradient, or background, groundwater quality. This evaluation would also confirm whether the detected halogenated organic compounds originated from off-site or from on-site activities.

7.0 FINDINGS- VAPOR EXTRACTION FEASIBILITY STUDY

7.1 Field and Analytical Test Results

The purpose of this study was to determine the feasibility of remediating the vadose zone beneath the concrete sump using a Vapor Extraction System (VES). During vacuum purging of MW-4 with a 92 cfm regenerative blower, steady state vapor concentrations of the extracted vapors were monitored using a PID. The vapor concentrations are reported as isobutylene in parts per million. (The PID is calibrated to isobutylene (C_4) at 100 parts per million). Vapor concentrations during the field test ranged from 407 to 516 parts per million as isobutylene. These concentrations steadily increased over a period of one hour during vapor extraction, indicating development of the formation.

A manometer was used to measure vacuum pressure in inches of water in the well during the test. Approximately 10 inches of water pressure was attained in MW-4 during vapor extraction.

Analytical tests on two vapor samples obtained from MW-4 indicated that 860 and 920 milligrams per cubic meter (mg/m^3) as kerosene were detected. Aromatic volatile organic compounds (benzene, toluene, ethylbenzene and xylene) were nondetect at analytical detection limits (Table 4).

7.2 Discussion

The vapor concentrations detected in the well during field and analytical testing are relatively low compared to those detected in the soil samples because kerosene vapors have a relatively low volatility. Non detect levels of volatile aromatic organic compounds in the vapor samples indicates kerosene as the primary vapor constituent in the vadose zone.

The increasing concentration of vapors detected during the field test suggests the full lateral extent of kerosene vapors in the vadose zone may not have been reached by the regenerative blower. A constant vapor concentration with time generally indicates the extent of the vapor plume has been reached.

Because of the relatively permeable soil conditions in the vadose zone, there was very little resistance to vapor flow during vapor extraction with the regenerative blower. This was indicated by the relatively low vacuum reading of 10 inches of water in the well during vapor extraction. These permeable soils should transmit vapors readily and thus are suited for remediation using a VES. After formation development, higher extraction flow rates and concentration levels can be anticipated.

7.3 Recommendations

Thorne Environmental, Inc recommends first removing the concrete sump and all its contents to eliminate the potential source of kerosene in the vadose zone.

A VES is recommended for soil remediation. The VES will consist of a 206 cfm regenerative blower for vapor extraction. Extracted vapors will be contained in carbon absorption canisters. The vapors in canisters will be incinerated offsite. The carbon will be regenerated offsite and can be used again.

Operation of the VES with carbon absorption canisters is easily permitted through the California Department of Health Services under Permit by Rule of the California Administrative Code, Title 22, Section 66392 (d).

Based on kerosene vapor concentrations from the feasibility test, an estimated amount of kerosene in the vadose zone, and a fixed vapor extraction rate, it is estimated that soil remediation will last approximately 6 months. This will require a continuous operation of a VES during this period. A proposal outlining our VES design calculations and remediation costs will follow under separate cover for your review.

We trust this report meets your current needs. Please contact us at (714) 693-1818 if you have any questions.

Sincerely,

THORNE ENVIRONMENTAL, INC.

Richard F. Reimers
Project Geologist

Richard J. Zipp,. R.G., C.E.G.
Principal Hydrogelogist

TABLE 1

Soil Test Results

EPA METHOD 8015 (mg/kg)
all fractions to 10 ppm

Sample No. & Depth	Gasoline	Diesel Fuel	Kerosene	Mineral Spirits	C_{16}-C_{20} Hydrocarbons	Detection Limit
SB-11 @ 5	ND	ND	ND	ND	ND	10
@10	ND	ND	30	ND	ND	10
@15	ND	ND	870	ND	ND	10
@20	ND	ND	3300	ND	ND	10
@25	ND	ND	3400	ND	ND	10
@30	ND	ND	2800	ND	ND	10
@35	ND	ND	480	ND	ND	10
@40	ND	ND	1500	ND	ND	10
@45	ND	ND	11000	ND	490	10
SB-12 @ 5	ND	ND	ND	ND	530	10
@15	ND	ND	ND	ND	ND	10
@25	ND	ND	ND	ND	ND	10
@30	ND	ND	ND	ND	ND	10
SB-19 @50	ND	ND	ND	ND	ND	10
@55	ND	ND	ND	ND	ND	10
@60	ND	ND	ND	ND	ND	10

ND = Not Detected

TABLE 2

Groundwater Test Results

Monitoring Well	EPA METHOD 8015 (mg/l) Gasoline	Mineral Spirits	Kerosene	Diesel Fuel	Heavy Hydrocarbons
MW-1	ND	ND	ND	ND	ND
MW-2	7	ND	ND	ND	ND
MW-3	ND	ND	ND	ND	ND
MW-4	ND	ND	ND	ND	ND
MW-2 (field blank)	ND	ND	ND	ND	ND
MW-4 (field blank)	ND	ND	ND	ND	ND
Detection Limit	0.5	0.5	0.5	0.5	5.0

ND = Not Detected

TABLE 2 (continued)

Groundwater Test Results

Monitoring Well	EPA METHOD 624 (mg/l)* Chloroform	1,1-Dichloroethane	1,1,-Dichloroethylene	Cis-1,2-Dichloroethylene	Tetrachloroethylene	1,1,1-Trichloroethane	Trichloroethylene	Bromoform	1,2 Dichloropropane	Trichlorofluromethane
MW-1	0.005	0.020	0.200	0.031	0.130	0.300	0.044	ND	ND	ND
MW-2	0.001	0.030	0.170	0.012	0.083	0.050	0.028	ND	0.015	0.003
MW-3	ND	0.024	0.230	0.058	0.096	0.080	0.026	ND	0.550	ND
MW-4	0.005	0.046	0.220	0.005	0.069	0.071	0.021	ND	ND	ND
MW-2 (field blank)	ND	ND	ND	ND	0.008	ND	ND	0.002	ND	ND
MW-4 (field blank)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Action level (CAC Title 22)	0.100	0.005	0.006	0.006	0.005	0.200	0.005	--	0.005	0.150

ND = Not Detected

* Those chemical constituents not listed under EPA Method 624 were not detected in any of the samples.

TABLE 2 (continued)

Groundwater Test Results

Monitoring Well	EPA METHOD 625 (mg/l)* Bis (2-ethylexyl) phthalate	2-methyl naphthalene	Naphthalene
MW-1	0.024	ND	ND
MW-2	ND	ND	ND
MW-3	ND	ND	ND
MW-4	ND	0.017	0.008
MW-2 (field blank)	--	--	--
MW-4 (field blank)	--	--	--

ND = Not Detected
-- = Not Analyzed

* Those chemical constituents not listed under EPA Method 625 were not detected in any of the samples.

Table.
1E-1066

TABLE 3

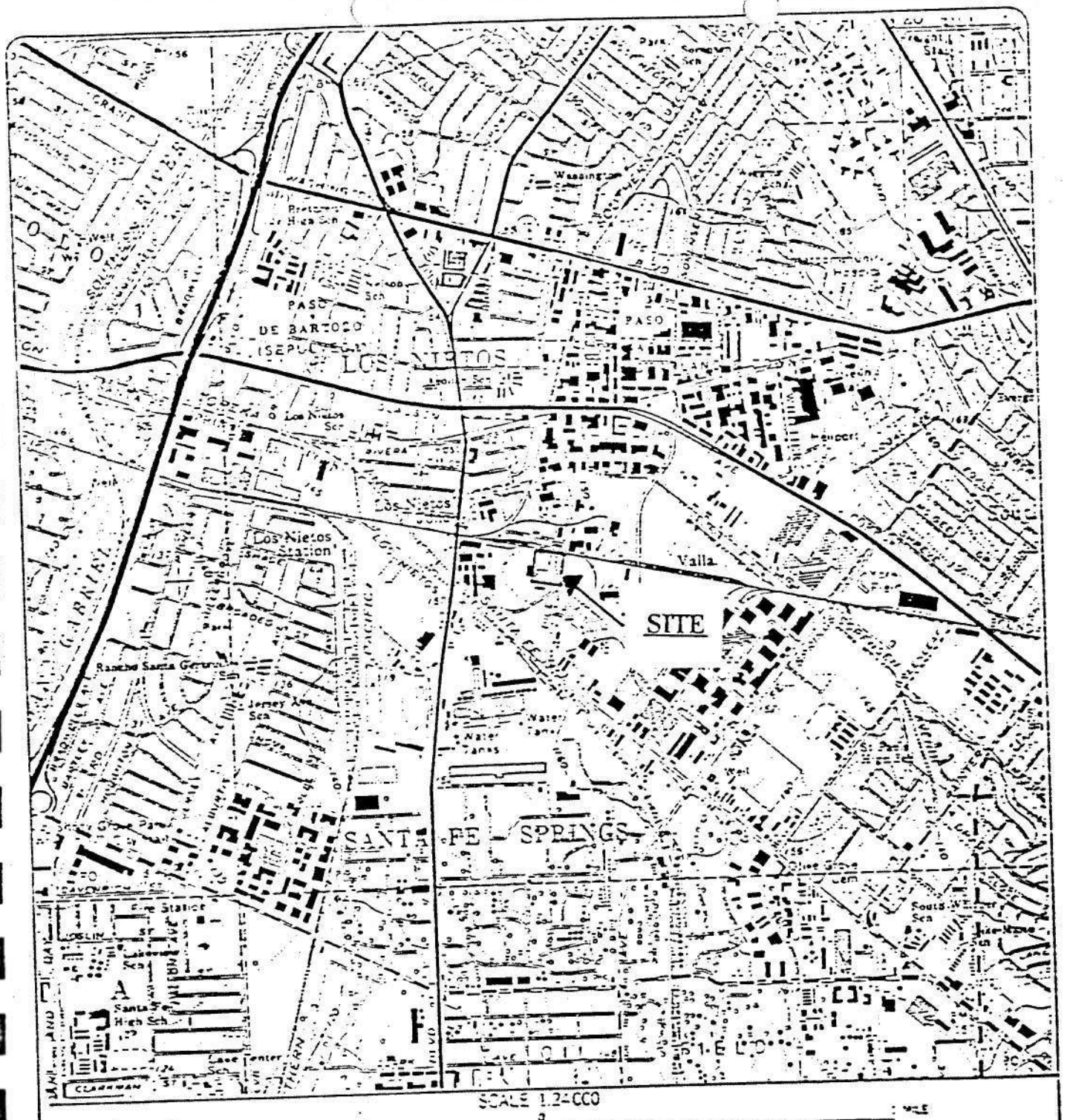
GROUNDWATER MONITORING WELL DATA
(Measured November 10, 1989)

Groundwater Monitoring Well	Surface Elevation (feet above sea level)	Depth To Groundwater (feet)	Groundwater Elevation (feet above sea level)	Free Product thickness (inches)
MW-1	148.69	53.59	95.10	0
MW-2	148.99	53.88	95.11	0
MW-3	148.76	54.00	94.76	0
MW-4	149.48	54.35	95.13	0

TABLE 4

VAPOR CONCENTRATIONS FROM VAPOR EXTRACTION FEASIBILTY TEST

SAMPLE	SAMPLE VOLUME (L)	BENZENE (ppm)	TOLUENE (ppm)	ETHYL-BENZENE (ppm)	TOTAL XYLENES (ppm)	TH AS KERO-SENE (mg/m^3)
1A	10	<2	<1	<0.5	<2	860
2A	10	<2	<0.8	<0.5	<2	920
Detection Limit		2	1	0.5	2	20



VICINITY MAP

DIVERSEY WYANDOTTE
8921 DICE ROAD
SANTA FE SPRINGS, CA

JOB #1E-1066
FIGURE 1

REFERENCE: U.S. Geological Survey, Whittier Quadrangle, 1981 edition

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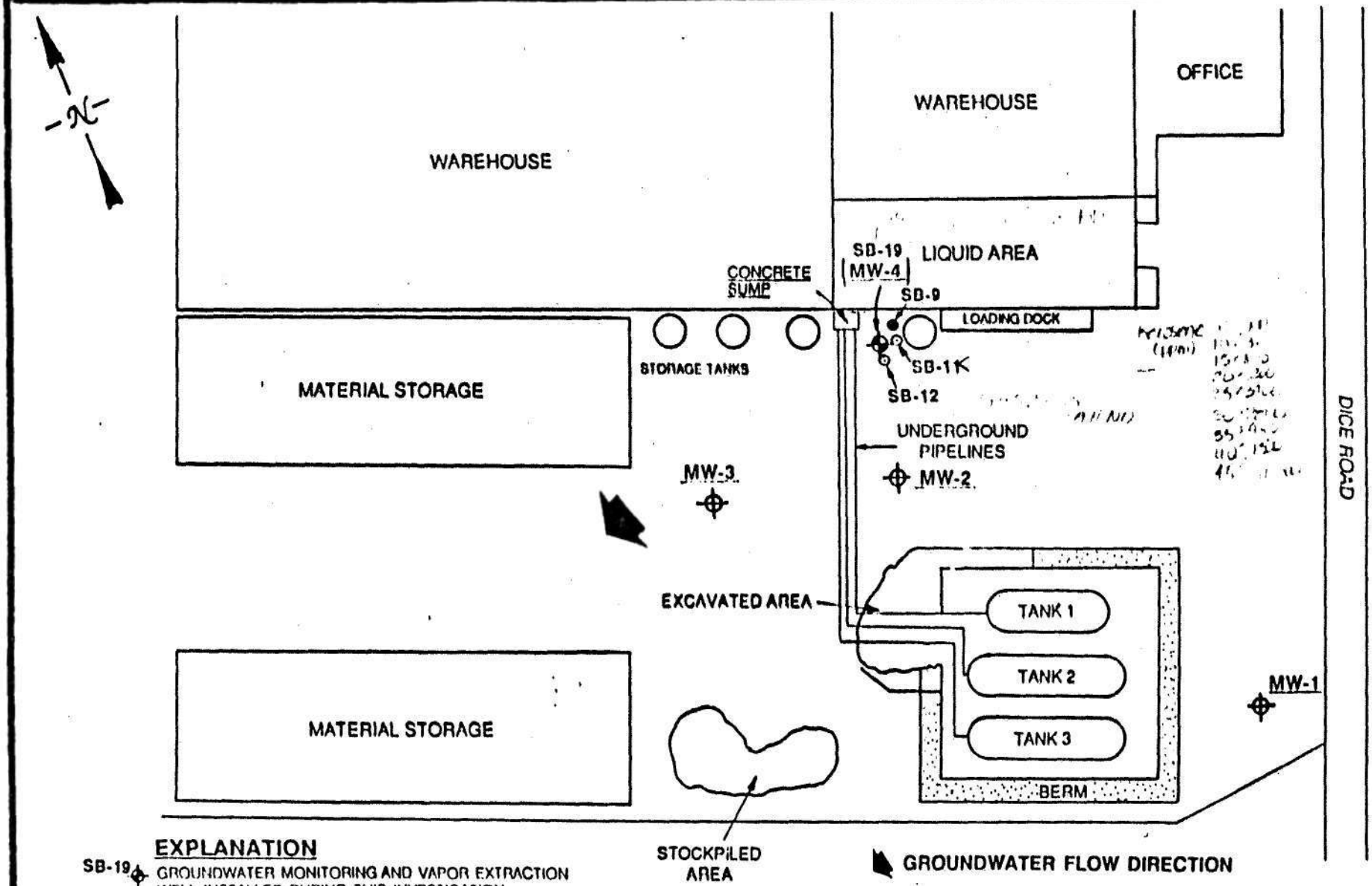

EXPLANATION

SB-19 ⊕ GROUNDWATER MONITORING AND VAPOR EXTRACTION WELL INSTALLED DURING THIS INVESTIGATION

MW-1 ⊕ GROUNDWATER MONITORING WELLS INSTALLED IN 1985

SB-9 ● SOIL BORING-PHASE I

SB-11 ⊙ SOIL BORING-PHASE II

NOT TO SCALE

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DIVERSEY WYANDOTTE
8921 DICE ROAD SANTA FE SPRINGS, CA
PLOT PLAN

PROJECT NO.	FIGURE
1E-1066	2

APPENDIX A

BORING LOGS

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS — LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS — LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

KEY TO LOG OF BORINGS

SAMPLES AND BLOW COUNTS

HAMMER BLOWS PER FOOT OF PENETRATION

INDICATES UNDISTURBED SAMPLE
STANDARD PENETRATION TEST SAMPLER DRIVEN WITH A 140-POUND HAMMER DROPPING 30 INCHES

ND = Not Detected
NA = Not Analyzed
PID = Photoionization detector

FIGURE A-1

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GROUNDWATER CHEMICAL ANALYSES	CHEMICAL ANALYSES: Laboratory	CHEMICAL ANALYSES: Field PID	BLOW COUNT	DEPTH (feet)	SAMPLE: INTERVAL	SAMPLE: NUMBER	LITHOLOGY SYMBOL	U.S.C.S. DESIGN.	SOIL DESCRIPTION
				0				CL	Decomposed asphalt, very oily
		85				2.5			Dark grey fine sandy clay, very moist, soft, strong hydrocarbon odor.
		145		5		6.5		SM	Grey silty fine sand, very moist, loose, strong hydrocarbon odor.
		210		10		11.5		SP	Grey fine sand, moist, dense, strong hydrocarbon odor.
		15		15		16.5			Grey medium sand, sligtly moist, dense, slight hydrocarbon odor.
									Boring completed at 16 1/2 feet. No groundwater encountered.
				20					
				25					

Surface Elevation: feet
Total Depth: 16.5 feet
Date Drilled: June 15, 1989

Logged By: F. Reimers
Supervised By:
Diameter of Boring: 2 inches
Water Encountered at: feet

THORNE ENVIRONMENTAL, Inc.
"TREATMENT BY DESIGN"

Project Number 1E-1066 July 1989

Diversey Wyandotte
Santa Fe Springs
LOG of BORING
SB-9

PLATE 9

GROUNDWATER CHEMICAL ANALYSES	CHEMICAL ANALYSES Laboratory EPA METHODS 8240 & 8270 (mg/kg)	CHEMICAL ANALYSES Field PID	BLOW COUNT	DEPTH (Feet)	SAMPLE INTERVAL	SAMPLE NUMBER	LITHOLOGY SYMBOL	U.S.C.S. DESIGN.	SOIL DESCRIPTION
				0				SM	1" Asphalt
	NA	90	33			3.5			Brownish gray silty fine to medium sand, moist, dense, slight odor.
	ND	140	34	5		6.5		ML	Brown fine sandy silt, slightly moist, dense, slight odor.
	30 KEROSENE	170	37	10		11.5		SP	Olive fine to medium sand, slightly moist, dense, strong odor.
	870 KEROSENE	465	64	15		16.5			Olive fine to medium sand, slightly moist, dense, strong odor.
	3300 KEROSENE	465	50	20		21.5		SP	Olive brown medium sand with fine gravel, slightly moist, dense, strong odor.
				25					

Surface Elevation: feet
Total Depth: 46.5 feet
Date Drilled: September 12, 1989

Logged By: P. Frank
Supervised By: F. Reimers
Diameter of Boring: 6 inches
Water Encountered at: feet

THORNE ENVIRONMENTAL, Inc.
"TREATMENT BY DESIGN"

Project Number 1E-1066 October 1989

Diversey Wyandotte
Santa Fe Springs
LOG of BORING
SB-11

PLATE
11

GROUNDWATER CHEMICAL ANALYSES	CHEMICAL ANALYSES Laboratory EPA METHODS 8240 & 8270 (mg/kg)	CHEMICAL ANALYSES Field PID	BLOW COUNT	DEPTH (Feet)	SAMPLE INTERVAL	SAMPLE NUMBER	LITHOLOGY SYMBOL	U.S.C.S. DESIGN.	SOIL DESCRIPTION
				0				SM	1" Asphalt
	NA	30	20			3.5			Brown silty fine to medium sand, slightly moist, no odor.
	530 C16-C20 HYDROCARBONS	30	23	5		6.5			Same as above
	NA	353	28	10		11.5		SP	Olive fine to medium sand, slightly moist, medium dense, strong odor.
	ND	350	65	15		16.5			Olive fine to coarse sand, slightly moist, dense, strong odor.
	ND	375	66	20		21.5		ML	Dark green to gray fine sandy silt, slightly moist, dense, strong odor.
				25					

Surface Elevation: feet
Total Depth: 31.5 feet
Date Drilled: September 12, 1989

Logged By: P. Frank
Supervised By: F. Reimers
Diameter of Boring: 6 inches
Water Encountered at: feet

THORNE ENVIRONMENTAL, Inc.
"TREATMENT BY DESIGN"

Project Number 1E-1066 October 1989

Diversey Wyandotte
Santa Fe Springs
LOG of BORING
SB-12

PLATE
12

GROUNDWATER CHEMICAL ANALYSES	CHEMICAL ANALYSES: Laboratory — EPA METHODS 8240 & 8270 (mg/kg)	CHEMICAL ANALYSES: Field — PID	BLOW COUNT	DEPTH (Feet)	SAMPLE: INTERVAL	SAMPLE: NUMBER	LITHOLOGY SYMBOL	U.S.C.S. DESIGN.	SOIL DESCRIPTION
	ND	105	62			26.5			Brown sandy silt with trace clay, slightly moist, dense, slight odor.
	ND	49	39	30		31.5			Reddish brown clayey silt with trace fine sand, slightly moist, dense, no odor.
									Boring completed at 31.5 feet. No groundwater encountered.
				35					
				40					
				45					
				50					

THORNE ENVIRONMENTAL, Inc.
"TREATMENT BY DESIGN"

Project Number 1E-1066 October 1989

Diversey Wyandotte
Santa Fe Springs
LOG of BORING
SB-12

PLATE 12

WELL CONSTRUCTION	CHEMICAL ANALYSES Laboratory EPA METHOD 8015 (mg/kg)	CHEMICAL ANALYSES Field PID ppm	BLOW COUNT	DEPTH (feet)	SAMPLE INTERVAL	SAMPLE NUMBER	LITHOLOGY SYMBOL	U.S.C.S. DESIGN.	SOIL DESCRIPTION
-Concrete Well Casing		30		0				SM	1" Asphalt Brown silty fine to medium sand, slightly moist, slight odor.
-Bentonite Seal		40		5				ML	Brown fine sandy silt, slightly moist, slight odor.
-Sand Well Screen		100		10				SP	Olive medium to coarse sand with fine gravels, slightly moist, strong odor.
		70		15					Olive fine to medium sand slightly moist, strong odor.
		100		20				SP	Same as above, grading with fine gravel.
				25					Dark olive fine to coarse sand, slightly moist, strong odor.

Surface Elevation: 149.5 feet
Total Depth: 69.5 feet
Date Drilled: November 3, 1989

Logged By: P. Frank
Supervised By: F. Reimers
Diameter of Boring: 8 inches
Water Encountered at: 54.0 feet

THORNE ENVIRONMENTAL, Inc.
"TREATMENT BY DESIGN"

Project Number 1E-1066 December 1989

Diversey Wyandotte
Santa Fe Springs
LOG of BORING
SB-19

PLATE
19

WELL CONSTRUCTION	CHEMICAL ANALYSES Laboratory EPA METHOD 8015 (mg/kg)	CHEMICAL ANALYSES Field PID ppm	BLOW COUNT	DEPTH (Feet)	SAMPLE INTERVAL	SAMPLE NUMBER	LITHOLOGY SYMBOL	U.S.C.S. DESIGN.	SOIL DESCRIPTION
								ML	
		75							Light brown fine sandy silt, trace clay, slightly moist, slight odor.
				30					
		150							Brown clayey silt with trace fine sand, moist, slight odor.
				35					
									Light reddish brown fine sandy silt, trace clay, slight odor.
				40					
		175						SM	Reddish brown silty fine sand, moist, slight odor.
				45					
		250						ML	Reddish brown fine sandy silt, slightly moist, strong odor.
								ML	
	ND	50		50		51.5			Brown fine sandy silt, moist, slight odor.
								CL	Reddish brown silty clay, very moist, no odor.

THORNE ENVIRONMENTAL, Inc.
"TREATMENT BY DESIGN"

Project Number 1E-1066 December 1989

Diversey Wyandotte
Santa Fe Springs
LOG of BORING
SB-19

PLATE
19

WELL CONSTRUCTION	CHEMICAL ANALYSES: Laboratory: EPA METHOD 8015 (mg/kg)	CHEMICAL ANALYSES: Field: PID ppm	BLOW COUNT	DEPTH (feet)	SAMPLE: INTERVAL	SAMPLE: NUMBER	LITHOLOGY SYMBOL	U.S.C.S. DESIGN.	SOIL DESCRIPTION
	ND	0		55		56.5		SP	Light brown medium to coarse sand saturated, no odor.
	ND	0		60		61.5		SP	Brown medium to coarse sand with fine gravel, very moist, no odor.
		0		65					Same as above.
				70					Boring completed at 69 1/2 feet on November 3, 1989 Ground water encountered at 54 feet.
				75					
				80					

THORNE ENVIRONMENTAL, Inc.
"TREATMENT BY DESIGN"

Project Number 1E-1066 December 1989

Diversey Wyandotte
Santa Fe Springs
LOG of BORING
SB-19

PLATE
19

APPENDIX B

SOIL & GROUNDWATER TEST RESULTS

November 17, 1989

RECEIVED
NOV 20 1989
ANAHEIM

WCAS
WEST COAST ANALYTICAL SERVICE, INC.
ANALYTICAL CHEMISTS

THORNE ENVIRONMENTAL
4887 E. La Palma Avenue, Suite 701
Anaheim, CA 92807

Attn: Fritz Reimers

JOB NO. 14081

LABORATORY REPORT

Samples Received: Nine (9) soils and four (4) liquids in duplicate
Date Received: 11-3-89
Purchase order No: 2558/Diversey

The samples were analyzed as follows:

Samples Analyzed	Analysis	Results
Three (3) liquids	Volatile Organics by EPA 624	Data Sheets
Two (2) liquids	Semi-Volatile Organics by EPA 625	Data Sheets
Three (3) soils and three (3) liquids	Fuel Hydrocarbons by modified EPA 8015 (LUFT Manual, May 1988)	Tables I & II

B. Michael Hovanec
Senior Staff Chemist

D. J. Northington, Ph.D.
Technical Director

9840 Alburtis Avenue • Santa Fe Springs, California 90670 • 213/948-2225 • FAX 213/948-5850

WEST COAST ANALYTICAL SERVICE, INC.

THORNE ENVIRONMENTAL
Mr. Fritz Reimers

Job # 14081
November 17, 1989

LABORATORY REPORT

TABLE I

Parts Per Million (mg/L)

Sample No.	C_5-C_{10} Gasoline	C_7-C_{12} Mineral Spirits	C_7-C_{15} Kerosene	C_{10}-C_{20} Diesel Fuel	C_{15}-C_{30} Heavy Hydrocarbons
MW-1A (lit.)	ND	ND	ND	ND	ND
MW-4A (lit.)	ND	ND	ND	ND	ND
MW-4A Blank	ND	ND	ND	ND	ND
Detection Limit	0.5	0.5	0.5	0.5	1.0

ND - Not Detected

Date Analyzed: 11-7-89

TABLE II

Parts Per Million (mg/Kg)

Sample No.	C_5-C_{10} Gasoline	C_7-C_{12} Mineral Spirits	C_7-C_{15} Kerosene	C_{10}-C_{20} Diesel Fuel	C_{15}-C_{30} Heavy Hydrocarbons
SB-19 @50'A	ND	ND	ND	ND	ND
SB-19 @55'A	ND	ND	ND	ND	ND
SB-19 @60'A	ND	ND	ND	ND	ND
Detection Limit	10	10	10	10	100

ND - Not Detected

Date Analyzed: 11-7-89

CLIENT: THORNE ENVIRONMENTAL
WCAS JOB #: 14081

SAMPLE: MW-1A (LIT.)

DATE RECEIVED: 11/03/89
DATE EXTRACTED: 11/07/89
DATE ANALYZED: 11/07/89

RUN NUMBER: 14081V10
SAMPLE AMOUNT: 2ML
MATRIX: WATER

VOLATILE ORGANICS (EPA 624/8240)

UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
67-64-1	ACETONE	ND	20.
71-43-2	BENZENE	ND	3.
75-27-4	BROMODICHLOROMETHANE	ND	3.
75-25-2	BROMOFORM	ND	3.
74-83-9	BROMOMETHANE	ND	20.
78-93-3	2-BUTANONE (MEK)	ND	20.
75-15-0	CARBON DISULFIDE	ND	3.
56-23-5	CARBON TETRACHLORIDE	ND	3.
108-90-7	CHLOROBENZENE	ND	3.
75-00-3	CHLOROETHANE	ND	20.
110-75-8	2-CHLOROETHYLVINYL ETHER	ND	30.
67-66-3	CHLOROFORM	5.	3.
74-87-3	CHLOROMETHANE	ND	20.
108-41-8	CHLOROTOLUENE	ND	3.
124-48-1	DIBROMOCHLOROMETHANE	ND	3.
95-50-1	1,2-DICHLOROBENZENE	ND	3.
541-73-1	1,3-DICHLOROBENZENE	ND	3.
106-46-7	1,4-DICHLOROBENZENE	ND	3.
75-34-3	1,1-DICHLOROETHANE	20.	3.
107-06-2	1,2-DICHLOROETHANE	ND	3.
75-35-4	1,1-DICHLOROETHYLENE	200.	3.
156-59-4	CIS-1,2-DICHLOROETHYLENE	31.	3.
156-60-5	TRANS-1,2-DICHLOROETHYLENE	ND	3.
78-87-5	1,2-DICHLOROPROPANE	ND	3.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	3.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	3.
100-41-4	ETHYLBENZENE	ND	3.
106-93-4	ETHYLENE DIBROMIDE	ND	3.
76-13-1	FREON-TF	ND	3.
119-78-6	2-HEXANONE	ND	20.
75-09-2	METHYLENE CHLORIDE	ND	20.
108-10-1	4-METHYL-2-PENTANONE (MIBK)	ND	20.
100-42-5	STYRENE	ND	3.
79-34-5	1,1,2,2-TETRACHLOROETHANE	ND	3.
127-18-4	TETRACHLOROETHYLENE	130.	3.
109-99-9	TETRAHYDROFURAN	ND	20.
108-88-3	TOLUENE	ND	3.
71-55-6	1,1,1-TRICHLOROETHANE	300.	3.
79-00-5	1,1,2-TRICHLOROETHANE	ND	3.
79-01-6	TRICHLOROETHYLENE	44.	3.
75-69-4	TRICHLOROFLUOROMETHANE	ND	3.
108-05-4	VINYL ACETATE	ND	20.
75-01-4	VINYL CHLORIDE	ND	20.
95-47-6	TOTAL XYLENES	ND	3.

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-1A (LIT.)
WCAS JOB #: 14081

UNITS: UG/L (PPB)

	COMPOUND NAME	FRACTION	APPROXIMATE CONCENTRATION
1	NONE FOUND	VOA	

CLIENT: THORNE ENVIRONMENTAL
WCAS JOB #: 14081

SAMPLE: MW-4A (LIT.)

DATE RECEIVED: 11/03/89
DATE EXTRACTED: 11/08/89
DATE ANALYZED: 11/08/89

RUN NUMBER: 14081V11
SAMPLE AMOUNT: 5ML
MATRIX: WATER

VOLATILE ORGANICS (EPA 624/8240)

UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
67-64-1	ACETONE	ND	5.
71-43-2	BENZENE	ND	1.
75-27-4	BROMODICHLOROMETHANE	ND	1.
75-25-2	BROMOFORM	ND	1.
74-83-9	BROMOMETHANE	ND	5.
78-93-3	2-BUTANONE (MEK)	ND	5.
75-15-0	CARBON DISULFIDE	ND	1.
56-23-5	CARBON TETRACHLORIDE	ND	1.
108-90-7	CHLOROBENZENE	ND	1.
75-00-3	CHLOROETHANE	ND	5.
110-75-8	2-CHLOROETHYLVINYL ETHER	ND	10.
67-66-3	CHLOROFORM	5.	1.
74-87-3	CHLOROMETHANE	ND	5.
108-41-8	CHLOROTOLUENE	ND	1.
124-48-1	DIBROMOCHLOROMETHANE	ND	1.
95-50-1	1,2-DICHLOROBENZENE	ND	1.
541-73-1	1,3-DICHLOROBENZENE	ND	1.
106-46-7	1,4-DICHLOROBENZENE	ND	1.
75-34-3	1,1-DICHLOROETHANE	46.	1.
107-06-2	1,2-DICHLOROETHANE	ND	1.
75-35-4	1,1-DICHLOROETHYLENE	220.	1.
156-59-4	CIS-1,2-DICHLOROETHYLENE	5.	1.
156-60-5	TRANS-1,2-DICHLOROETHYLENE	ND	1.
78-87-5	1,2-DICHLOROPROPANE	ND	1.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	1.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	1.
100-41-4	ETHYLBENZENE	ND	1.
106-93-4	ETHYLENE DIBROMIDE	ND	1.
76-13-1	FREON-TF	ND	1.
119-78-6	2-HEXANONE	ND	5.
75-09-2	METHYLENE CHLORIDE	ND	5.
108-10-1	4-METHYL-2-PENTANONE (MIBK)	ND	5.
100-42-5	STYRENE	ND	1.
79-34-5	1,1,2,2-TETRACHLOROETHANE	ND	1.
127-18-4	TETRACHLOROETHYLENE	69.	1.
109-99-9	TETRAHYDROFURAN	ND	5.
108-88-3	TOLUENE	ND	1.
71-55-6	1,1,1-TRICHLOROETHANE	71.	1.
79-00-5	1,1,2-TRICHLOROETHANE	ND	1.
79-01-6	TRICHLOROETHYLENE	21.	1.
75-69-4	TRICHLOROFLUOROMETHANE	ND	1.
108-05-4	VINYL ACETATE	ND	5.
75-01-4	VINYL CHLORIDE	ND	5.
95-47-6	TOTAL XYLENES	ND	1.

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-4A (LIT.)
WCAS JOB #: 14081

UNITS: UG/L (PPB)

	COMPOUND NAME	FRACTION	APPROXIMATE CONCENTRATION
1	C9-C10 ALKYLBENZENES	VOA	100.

CLIENT: THORNE ENVIRONMENTAL
WCAS JOB #: 14081

SAMPLE: MW-4A BLANK

DATE RECEIVED: 11/03/89
DATE EXTRACTED: 11/07/89
DATE ANALYZED: 11/07/89

RUN NUMBER: 14081V1
SAMPLE AMOUNT: 5ML
MATRIX: WATER

VOLATILE ORGANICS (EPA 624/8240)

UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
67-64-1	ACETONE	ND	5.
71-43-2	BENZENE	ND	1.
75-27-4	BROMODICHLOROMETHANE	ND	1.
75-25-2	BROMOFORM	ND	1.
74-83-9	BROMOMETHANE	ND	5.
78-93-3	2-BUTANONE (MEK)	ND	5.
75-15-0	CARBON DISULFIDE	ND	1.
56-23-5	CARBON TETRACHLORIDE	ND	1.
108-90-7	CHLOROBENZENE	ND	1.
75-00-3	CHLOROETHANE	ND	5.
110-75-8	2-CHLOROETHYLVINYL ETHER	ND	10.
67-66-3	CHLOROFORM	ND	1.
74-87-3	CHLOROMETHANE	ND	5.
108-41-8	CHLOROTOLUENE	ND	1.
124-48-1	DIBROMOCHLOROMETHANE	ND	1.
95-50-1	1,2-DICHLOROBENZENE	ND	1.
541-73-1	1,3-DICHLOROBENZENE	ND	1.
106-46-7	1,4-DICHLOROBENZENE	ND	1.
75-34-3	1,1-DICHLOROETHANE	ND	1.
107-06-2	1,2-DICHLOROETHANE	ND	1.
75-35-4	1,1-DICHLOROETHYLENE	ND	1.
156-59-4	CIS-1,2-DICHLOROETHYLENE	ND	1.
156-60-5	TRANS-1,2-DICHLOROETHYLENE	ND	1.
78-87-5	1,2-DICHLOROPROPANE	ND	1.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	1.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	1.
100-41-4	ETHYLBENZENE	ND	1.
106-93-4	ETHYLENE DIBROMIDE	ND	1.
76-13-1	FREON-TF	ND	1.
119-78-6	2-HEXANONE	ND	5.
75-09-2	METHYLENE CHLORIDE	ND	5.
108-10-1	4-METHYL-2-PENTANONE (MIBK)	ND	5.
100-42-5	STYRENE	ND	1.
79-34-5	1,1,2,2-TETRACHLOROETHANE	ND	1.
127-18-4	TETRACHLOROETHYLENE	ND	1.
109-99-9	TETRAHYDROFURAN	ND	5.
108-88-3	TOLUENE	ND	1.
71-55-6	1,1,1-TRICHLOROETHANE	ND	1.
79-00-5	1,1,2-TRICHLOROETHANE	ND	1.
79-01-6	TRICHLOROETHYLENE	ND	1.
75-69-4	TRICHLOROFLUOROMETHANE	ND	1.
108-05-4	VINYL ACETATE	ND	5.
75-01-4	VINYL CHLORIDE	ND	5.
95-47-6	TOTAL XYLENES	ND	1.

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-4A BLANK
WCAS JOB #: 14081

UNITS: UG/L (PPB)

	COMPOUND NAME	FRACTION	APPROXIMATE CONCENTRATION
1	NONE FOUND	VOA	

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-1A (LIT.)
WCAS JOB #: 14081

DATE RECEIVED: 11/03/89 RUN NUMBER: 14081B2
DATE EXTRACTED: 11/09/89 SAMPLE AMOUNT: 900ML:1ML
DATE ANALYZED: 11/14/89 MATRIX: WATER

SEMI-VOLATILE ORGANICS (EPA 625/8270) UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
83-32-9	ACENAPHTHENE	ND	1.
208-96-8	ACENAPHTHYLENE	ND	1.
120-12-7	ANTHRACENE	ND	1.
56-55-3	BENZO(A)ANTHRACENE	ND	1.
205-99-2	BENZO(B & K)FLUORANTHENES	ND	1.
191-24-2	BENZO(GHI)PERYLENE	ND	1.
50-32-8	BENZO(A)PYRENE	ND	1.
65-85-0	BENZOIC ACID	ND	5.
100-51-6	BENZYL ALCOHOL	ND	1.
111-91-1	BIS(2-CHLOROETHOXY)METHANE	ND	1.
111-44-4	BIS(2-CHLOROETHYL)ETHER	ND	1.
39638-32-9	BIS(2-CHLOROISOPROPYL)ETHER	ND	1.
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	24.	5.
101-55-3	4-BROMOPHENYL PHENYL ETHER	ND	1.
85-68-7	BUTYL BENZYL PHTHALATE	ND	1.
106-47-8	4-CHLOROANILINE	ND	1.
59-50-7	4-CHLORO-3-METHYLPHENOL	ND	1.
91-58-7	2-CHLORONAPHTHALENE	ND	1.
95-57-8	2-CHLOROPHENOL	ND	1.
7005-72-3	4-CHLOROPHENYL PHENYL ETHER	ND	1.
218-01-9	CHRYSENE	ND	1.
53-70-3	DIBENZO(A,H)ANTHRACENE	ND	1.
132-64-9	DIBENZOFURAN	ND	1.
84-74-2	DI-N-BUTYL PHTHALATE	ND	1.
95-50-1	1,2-DICHLOROBENZENE	ND	1.
541-73-1	1,3-DICHLOROBENZENE	ND	1.
106-46-7	1,4-DICHLOROBENZENE	ND	1.
91-94-1	3,3'-DICHLOROBENZIDINE	ND	2.
120-33-2	2,4-DICHLOROPHENOL	ND	1.
84-66-2	DIETHYL PHTHALATE	ND	1.
105-67-9	2,4-DIMETHYLPHENOL	ND	1.
131-11-3	DIMETHYL PHTHALATE	ND	1.
534-52-1	4,6-DINITRO-2-METHYLPHENOL	ND	5.
51-28-5	2,4-DINITROPHENOL	ND	5.
121-14-2	2,4-DINITROTOLUENE	ND	1.
606-20-2	2,6-DINITROTOLUENE	ND	1.
117-84-0	DI-N-OCTYL PHTHALATE	ND	1.
206-44-0	FLUORANTHENE	ND	1.
86-73-7	FLUORENE	ND	1.
118-74-1	HEXACHLOROBENZENE	ND	1.
87-68-3	HEXACHLOROBUTADIENE	ND	1.
77-47-4	HEXACHLOROCYCLOPENTADIENE	ND	1.
67-72-1	HEXACHLOROETHANE	ND	1.
193-39-5	INDENO(1,2,3-CD)PYRENE	ND	1.
78-59-1	ISOPHORONE	ND	1.
91-57-6	2-METHYLNAPHTHALENE	ND	1.

CLIENT: THORNE ENVIRONMENTAL
WCAS JOB #: 14081

SAMPLE: MW-1A (LIT.)

DATE RECEIVED: 11/03/89
DATE EXTRACTED: 11/09/89
DATE ANALYZED: 11/14/89

RUN NUMBER: 14081B2
SAMPLE AMOUNT: 900ML:1ML
MATRIX: WATER

SEMI-VOLATILE ORGANICS (EPA 625/8270)

UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
95-48-7	2-METHYLPHENOL	ND	1.
106-44-5	4-METHYLPHENOL	ND	1.
91-20-3	NAPHTHALENE	ND	1.
88-74-4	2-NITROANILINE	ND	5.
99-09-2	3-NITROANILINE	ND	5.
100-01-6	4-NITROANILINE	ND	5.
98-95-3	NITROBENZENE	ND	1.
88-75-5	2-NITROPHENOL	ND	1.
100-02-7	4-NITROPHENOL	ND	5.
86-30-6	N-NITROSODIPHENYLAMINE **	ND	1.
621-64-7	N-NITROSODIPROPYLAMINE	ND	1.
87-86-5	PENTACHLOROPHENOL	ND	5.
85-01-8	PHENANTHRENE	ND	1.
108-95-2	PHENOL	ND	1.
129-00-0	PYRENE	ND	1.
120-82-1	1,2,4-TRICHLOROBENZENE	ND	1.
95-95-4	2,4,5-TRICHLOROPHENOL	ND	5.
88-06-2	2,4,6-TRICHLOROPHENOL	ND	1.

** - Cannot be separated from diphenylamine

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-1A (LIT.)
WCAS JOB #: 14081

UNITS: UG/L (PPB)

	COMPOUND NAME	FRACTION	APPROXIMATE CONCENTRATION
1	C18-C20 HYDROCARBONS	BNA	20.
2	UNIDENTIFIED COMPOUNDS	BNA	30.

CLIENT: THORNE ENVIRONMENTAL
WCAS JOB #: 14081

SAMPLE: MW-4A (LIT.)

DATE RECEIVED: 11/03/89
DATE EXTRACTED: 11/09/89
DATE ANALYZED: 11/14/89

RUN NUMBER: 14081B3
SAMPLE AMOUNT: 900ML:1ML
MATRIX: WATER

SEMI-VOLATILE ORGANICS (EPA 625/8270)

UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
83-32-9	ACENAPHTHENE	ND	1.
208-96-8	ACENAPHTHYLENE	ND	1.
120-12-7	ANTHRACENE	ND	1.
56-55-3	BENZO(A)ANTHRACENE	ND	1.
205-99-2	BENZO(B & K)FLUORANTHENES	ND	1.
191-24-2	BENZO(GHI)PERYLENE	ND	1.
50-32-8	BENZO(A)PYRENE	ND	1.
65-85-0	BENZOIC ACID	ND	5.
100-51-6	BENZYL ALCOHOL	ND	1.
111-91-1	BIS(2-CHLOROETHOXY)METHANE	ND	1.
111-44-4	BIS(2-CHLOROETHYL)ETHER	ND	1.
39638-32-9	BIS(2-CHLOROISOPROPYL)ETHER	ND	1.
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	ND	5.
101-55-3	4-BROMOPHENYL PHENYL ETHER	ND	1.
85-68-7	BUTYL BENZYL PHTHALATE	ND	1.
106-47-8	4-CHLOROANILINE	ND	1.
59-50-7	4-CHLORO-3-METHYLPHENOL	ND	1.
91-58-7	2-CHLORONAPHTHALENE	ND	1.
95-57-8	2-CHLOROPHENOL	ND	1.
7005-72-3	4-CHLOROPHENYL PHENYL ETHER	ND	1.
218-01-9	CHRYSENE	ND	1.
53-70-3	DIBENZO(A,H)ANTHRACENE	ND	1.
132-64-9	DIBENZOFURAN	ND	1.
84-74-2	DI-N-BUTYL PHTHALATE	ND	1.
95-50-1	1,2-DICHLOROBENZENE	ND	1.
541-73-1	1,3-DICHLOROBENZENE	ND	1.
106-46-7	1,4-DICHLOROBENZENE	ND	1.
91-94-1	3,3'-DICHLOROBENZIDINE	ND	2.
120-33-2	2,4-DICHLOROPHENOL	ND	1.
84-66-2	DIETHYL PHTHALATE	ND	1.
105-67-9	2,4-DIMETHYLPHENOL	ND	1.
131-11-3	DIMETHYL PHTHALATE	ND	1.
534-52-1	4,6-DINITRO-2-METHYLPHENOL	ND	5.
51-28-5	2,4-DINITROPHENOL	ND	5.
121-14-2	2,4-DINITROTOLUENE	ND	1.
606-20-2	2,6-DINITROTOLUENE	ND	1.
117-84-0	DI-N-OCTYL PHTHALATE	ND	1.
206-44-0	FLUORANTHENE	ND	1.
86-73-7	FLUORENE	ND	1.
118-74-1	HEXACHLOROBENZENE	ND	1.
87-68-3	HEXACHLOROBUTADIENE	ND	1.
77-47-4	HEXACHLOROCYCLOPENTADIENE	ND	1.
67-72-1	HEXACHLOROETHANE	ND	1.
193-39-5	INDENO(1,2,3-CD)PYRENE	ND	1.
78-59-1	ISOPHORONE	ND	1.
91-57-6	2-METHYLNAPHTHALENE	17.	1.

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-4A (LIT.)
WCAS JOB #: 14081

DATE RECEIVED: 11/03/89 RUN NUMBER: 14081B3
DATE EXTRACTED: 11/09/89 SAMPLE AMOUNT: 900ML:1ML
DATE ANALYZED: 11/14/89 MATRIX: WATER

SEMI-VOLATILE ORGANICS (EPA 625/8270) UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
95-48-7	2-METHYLPHENOL	ND	1.
106-44-5	4-METHYLPHENOL	ND	1.
91-20-3	NAPHTHALENE	8.	1.
88-74-4	2-NITROANILINE	ND	5.
99-09-2	3-NITROANILINE	ND	5.
100-01-6	4-NITROANILINE	ND	5.
98-95-3	NITROBENZENE	ND	1.
88-75-5	2-NITROPHENOL	ND	1.
100-02-7	4-NITROPHENOL	ND	5.
86-30-6	N-NITROSODIPHENYLAMINE **	ND	1.
621-64-7	N-NITROSODIPROPYLAMINE	ND	1.
87-86-5	PENTACHLOROPHENOL	ND	5.
85-01-8	PHENANTHRENE	ND	1.
108-95-2	PHENOL	ND	1.
129-00-0	PYRENE	ND	1.
120-82-1	1,2,4-TRICHLOROBENZENE	ND	1.
95-95-4	2,4,5-TRICHLOROPHENOL	ND	5.
88-06-2	2,4,6-TRICHLOROPHENOL	ND	1.

** - Cannot be separated from diphenylamine

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-4A (LIT.)
WCAS JOB #: 14081

UNITS: UG/L (PPB)

	COMPOUND NAME	FRACTION	APPROXIMATE CONCENTRATION
1	1-METHYLNAPHTHALENE	BNA	10.
2	DIMETHYLNAPHTHALENES	BNA	30.
3	C9-C16 HYDROCARBON MATRIX	BNA	2000.
4	UNIDENTIFIED COMPOUNDS	BNA	30.

Data Reporting Qualifiers

Value - If the result is a value greater than or equal to the Detection Limit (DL), the value is reported.

ND - Indicates that the compound was analyzed for but not detected. The minimum DL for the sample with the ND is reported based on necessary concentration or dilution actions.

TR - Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified DL but greater than zero.

MED-TOX ASSOCIATES, INC.
ANALYTICAL REQUEST/CHAIN OF CUSTODY FORM
(Complete Information on Opposite Side)

Page ___ of ___

CLIENT Diversey Wyandotte
CLIENT JOB REF.: IE 1066
LAB PROJECT NO: ___ (lab use only)

Date: 11-3-89
SAMPLER(S): PETER FRANK

CLIENT SAMPLE IDENTIFICATION	DATE	Lab Number (lab use only)	AIR VOLUME (Liters)	NO. CONT.	SAMPLE TYPE * Water	ANALYSES: EPA 8015 TPH	EPA 624	EPA 625	COMMENTS/ INTERFERENCES
MW-1A Blank	11/3/89					✓	✓	✓	
MW-1B Blank									
MW-1A (lit.)						✓	✓	✓	
MW-1B (lit.)									
MW-4A Blank						✓	✓	✓	
MW-4B Blank									
MW-4A (lit.)						✓	✓	✓	
MW-4B (lit.)	↓								

Relinquished by: (Signature) Peter Frank	Date 11-3-89	Time 5:35 pm	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date 11/3/89	Time 5:40 pm
Dispatched by: (Signature)	Date	Time	Received for lab by: (Signature) April Richards #14081	Date 11/3/89	Time 5:40 pm
Method of Shipment:			Lab Comments:		

[redacted]SAM[redacted]. .[redacted]SPE[redacted]): [redacted]37[redacted]0.8[redacted]MCE[redacted]2) 25[redacted]mm 0.[redacted]m MCEF; (3) 25 mm 0.4 um polycarb. filter; (4) P[redacted] filter, [redacted] pore size; (5) Charcoal tube; (6) Silica gel tube (7) Water, (8) [redacted]oil, [redacted]9) [redacted] Sa[redacted]e, [redacted]

MED-TOX ASSOCIATES, INC.
ANALYTICAL REQUEST/CHAIN OF CUSTODY FORM
(Complete Information on Opposite Side)

CLIENT Diversey Wyandotte
CLIENT JOB REF.: 161066
LAB PROJECT NO: _____ (lab use only)

Date: 11-3-89
SAMPLER(S): PETER FRANK

CLIENT SAMPLE IDENTIFICATION	DATE	Lab Number (lab use only)	AIR VOLUME (Liters)	NO. CONT.	SAMPLE TYPE * Soil	ANALYSES: 8015 All Extractables to 10 PPM	COMMENTS/ INTERFERENCES
SB-19 @ 45' A	11/2/89						
B							
SB-19 @ 50' A						✓	
B							
SB-19 @ 55' A						✓	
B							
SB-19 @ 60' A						✓	
B							
SB-19 @ 65' A							

Relinquished by: (Signature) Peter Frank	Date 11-3-89	Time 535pm	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Dispatched by: (Signature)	Date	Time	Received for lab by: (Signature) Ann Richards 14081	Date 11/3/89	Time 5:40pm
Method of Shipment:			Lab Comments:		

* SAMPLE TYPE: (SPECIFY): (1) 37 mm 0.8 um MCEF; 2) 25 mm 0.[illegible] m MCEF; (3) 25 mm 0.4 um polycarb. filter; (4) PVC filter, diam. pore size ____; (5) Charcoal tube; (6) [illegible] gel [illegible] Wat[illegible] (8) [illegible]l; [illegible]) B[illegible] Sa[illegible]; [illegible] [illegible]
(11) Other

November 21, 1989

WCAS
WEST COAST
ANALYTICAL
SERVICE, INC.

THORNE ENVIRONMENTAL
4887 E. La Palma Ave., Suite 701
Anaheim, CA 92807

Attn: Fritz Reimers

JOB NO. 14122

A

LABORATORY REPORT

Samples Received: Two (2) liquids in quadruplicate and one (1) liquid in duplicate
Date Received: 11-9-89
Purchase Order No: 2562/Proj#: IE 1066-008

The samples were analyzed as follows:

Samples Analyzed	Analysis	Results
Three (3) liquids	Volatile Organics by EPA 624	Data Sheets
Two (2) liquids	Semi-Volatile Organics by EPA 625	Data Sheets
Three (3) liquids	Fuel Hydrocarbons by modified EPA 8015 (LUFT Manual, May 1988)	Table I

Michael Shelton
Senior Chemist

D. J. Northington, Ph.D.
Technical Director

9840 Alburtis Avenue • Santa Fe Springs, California 90670 • 213/948-2225

WEST COAST ANALYTICAL SERVICE, INC.

THORNE ENVIRONMENTAL
Mr. Fritz Reimers

Job # 14122
November 21, 1989

LABORATORY REPORT

TABLE I

Parts Per Million (mg/L)

Sample No.	C_5-C_{10} Weathered Gasoline	C_7-C_{12} Mineral Spirits	C_7-C_{15} Kerosene	C_{10}-C_{20} Diesel Fuel	C_{15}-C_{30} Heavy Hydrocarbons
MW-2 Field Blank	ND	ND	ND	ND	ND
MW-2A	7	ND	ND	ND	ND
MW-3A	ND	ND	ND	ND	ND
Detection Limit	0.5	0.5	0.5	0.5	5.0

ND - Not Detected

Date Analyzed: 11-10-89

WCAS

CLIENT: THORNE ENVIRONMENTAL
WCAS JOB #: 14122

SAMPLE: MW-2 FIELD BLANK

DATE RECEIVED: 11/09/89
DATE EXTRACTED: 11/15/89
DATE ANALYZED: 11/15/89

RUN NUMBER: 14122V1
SAMPLE AMOUNT: 5ML
MATRIX: WATER

VOLATILE ORGANICS (EPA 624/8240)

UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
67-64-1	ACETONE	ND	5.
71-43-2	BENZENE	ND	1.
75-27-4	BROMODICHLOROMETHANE	ND	1.
75-25-2	BROMOFORM	2.	1.
74-83-9	BROMOMETHANE	ND	5.
78-93-3	2-BUTANONE (MEK)	ND	5.
75-15-0	CARBON DISULFIDE	ND	1.
56-23-5	CARBON TETRACHLORIDE	ND	1.
108-90-7	CHLOROBENZENE	ND	1.
75-00-3	CHLOROETHANE	ND	5.
110-75-8	2-CHLOROETHYLVINYL ETHER	ND	10.
67-66-3	CHLOROFORM	ND	1.
74-87-3	CHLOROMETHANE	ND	5.
108-41-8	CHLOROTOLUENE	ND	1.
124-48-1	DIBROMOCHLOROMETHANE	ND	1.
95-50-1	1,2-DICHLOROBENZENE	ND	1.
541-73-1	1,3-DICHLOROBENZENE	ND	1.
106-46-7	1,4-DICHLOROBENZENE	ND	1.
75-34-3	1,1-DICHLOROETHANE	ND	1.
107-06-2	1,2-DICHLOROETHANE	ND	1.
75-35-4	1,1-DICHLOROETHYLENE	ND	1.
156-59-4	CIS-1,2-DICHLOROETHYLENE	ND	1.
156-60-5	TRANS-1,2-DICHLOROETHYLENE	ND	1.
78-87-5	1,2-DICHLOROPROPANE	ND	1.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	1.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	1.
100-41-4	ETHYLBENZENE	ND	1.
106-93-4	'ETHYLENE DIBROMIDE	ND	1.
76-13-1	FREON-TF	ND	1.
119-78-6	2-HEXANONE	ND	5.
75-09-2	METHYLENE CHLORIDE	ND	5.
108-10-1	4-METHYL-2-PENTANONE (MIBK)	ND	5.
100-42-5	STYRENE	ND	1.
79-34-5	1,1,2,2-TETRACHLOROETHANE	ND	1.
127-18-4	TETRACHLOROETHYLENE	8.	1.
109-99-9	TETRAHYDROFURAN	ND	5.
108-88-3	TOLUENE	ND	1.
71-55-6	1,1,1-TRICHLOROETHANE	ND	1.
79-00-5	1,1,2-TRICHLOROETHANE	ND	1.
79-01-6	TRICHLOROETHYLENE	ND	1.
75-69-4	TRICHLOROFLUOROMETHANE	ND	1.
108-05-4	VINYL ACETATE	ND	5.
75-01-4	VINYL CHLORIDE	ND	5.
95-47-6	TOTAL XYLENES	ND	1.

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-2 FIELD BLANK
WCAS JOB #: 14122

UNITS: UG/L (PPB)

	COMPOUND NAME	FRACTION	APPROXIMATE CONCENTRATION
1	NONE FOUND	VOA	

CLIENT: THORNE ENVIRONMENTAL
WCAS JOB #: 14122

SAMPLE: MW-2A

DATE RECEIVED: 11/09/89
DATE EXTRACTED: 11/16/89
DATE ANALYZED: 11/16/89

RUN NUMBER: 14122V2
SAMPLE AMOUNT: 5ML
MATRIX: WATER

VOLATILE ORGANICS (EPA 624/8240)

UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
67-64-1	ACETONE	ND	5.
71-43-2	BENZENE	ND	1.
75-27-4	BROMODICHLOROMETHANE	ND	1.
75-25-2	BROMOFORM	ND	1.
74-83-9	BROMOMETHANE	ND	5.
78-93-3	2-BUTANONE (MEK)	ND	5.
75-15-0	CARBON DISULFIDE	ND	1.
56-23-5	CARBON TETRACHLORIDE	ND	1.
108-90-7	CHLOROBENZENE	ND	1.
75-00-3	CHLOROETHANE	ND	5.
110-75-8	2-CHLOROETHYLVINYL ETHER	ND	10.
67-66-3	CHLOROFORM	1.	1.
74-87-3	CHLOROMETHANE	ND	5.
108-41-8	CHLOROTOLUENE	ND	1.
124-48-1	DIBROMOCHLOROMETHANE	ND	1.
95-50-1	1,2-DICHLOROBENZENE	ND	1.
541-73-1	1,3-DICHLOROBENZENE	ND	1.
106-46-7	1,4-DICHLOROBENZENE	ND	1.
75-34-3	1,1-DICHLOROETHANE	30.	1.
107-06-2	1,2-DICHLOROETHANE	ND	1.
75-35-4	1,1-DICHLOROETHYLENE	170.	1.
156-59-4	CIS-1,2-DICHLOROETHYLENE	12.	1.
156-60-5	TRANS-1,2-DICHLOROETHYLENE	ND	1.
78-87-5	1,2-DICHLOROPROPANE	15.	1.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	1.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	1.
100-41-4	ETHYLBENZENE	ND	1.
106-93-4	ETHYLENE DIBROMIDE	ND	1.
76-13-1	FREON-TF	ND	1.
119-78-6	2-HEXANONE	ND	5.
75-09-2	METHYLENE CHLORIDE	ND	5.
108-10-1	4-METHYL-2-PENTANONE (MIBK)	ND	5.
100-42-5	STYRENE	ND	1.
79-34-5	1,1,2,2-TETRACHLOROETHANE	ND	1.
127-18-4	TETRACHLOROETHYLENE	83.	1.
109-99-9	TETRAHYDROFURAN	ND	5.
108-88-3	TOLUENE	ND	1.
71-55-6	1,1,1-TRICHLOROETHANE	50.	1.
79-00-5	1,1,2-TRICHLOROETHANE	ND	1.
79-01-6	TRICHLOROETHYLENE	28.	1.
75-69-4	TRICHLOROFLUOROMETHANE	3.	1.
108-05-4	VINYL ACETATE	ND	5.
75-01-4	VINYL CHLORIDE	ND	5.
95-47-6	TOTAL XYLENES	ND	1.

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-2A
WCAS JOB #: 14122

UNITS: UG/L (PPB)

	COMPOUND NAME	FRACTION	APPROXIMATE CONCENTRATION
1	NONE FOUND	VOA	

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-3A
WCAS JOB #: 14122

DATE RECEIVED: 11/09/89 RUN NUMBER: 14122V5
DATE EXTRACTED: 11/16/89 SAMPLE AMOUNT: 1ML
DATE ANALYZED: 11/16/89 MATRIX: WATER

VOLATILE ORGANICS (EPA 624/8240) UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
67-64-1	ACETONE	ND	30.
71-43-2	BENZENE	ND	5.
75-27-4	BROMODICHLOROMETHANE	ND	5.
75-25-2	BROMOFORM	ND	5.
74-83-9	BROMOMETHANE	ND	30.
78-93-3	2-BUTANONE (MEK)	ND	30.
75-15-0	CARBON DISULFIDE	ND	5.
56-23-5	CARBON TETRACHLORIDE	ND	5.
108-90-7	CHLOROBENZENE	ND	5.
75-00-3	CHLOROETHANE	ND	30.
110-75-8	2-CHLOROETHYLVINYL ETHER	ND	50.
67-66-3	CHLOROFORM	ND	5.
74-87-3	CHLOROMETHANE	ND	30.
108-41-8	CHLOROTOLUENE	ND	5.
124-48-1	DIBROMOCHLOROMETHANE	ND	5.
95-50-1	1,2-DICHLOROBENZENE	ND	5.
541-73-1	1,3-DICHLOROBENZENE	ND	5.
106-46-7	1,4-DICHLOROBENZENE	ND	5.
75-34-3	1,1-DICHLOROETHANE	24.	5.
107-06-2	1,2-DICHLOROETHANE	ND	5.
75-35-4	1,1-DICHLOROETHYLENE	230.	5.
156-59-4	CIS-1,2-DICHLOROETHYLENE	58.	5.
156-60-5	TRANS-1,2-DICHLOROETHYLENE	ND	5.
78-87-5	1,2-DICHLOROPROPANE	550.	5.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	5.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	5.
100-41-4	ETHYLBENZENE	ND	5.
106-93-4	ETHYLENE DIBROMIDE	ND	5.
76-13-1	FREON-TF	ND	5.
119-78-6	2-HEXANONE	ND	30.
75-09-2	METHYLENE CHLORIDE	ND	30.
108-10-1	4-METHYL-2-PENTANONE (MIBK)	ND	30.
100-42-5	STYRENE	ND	5.
79-34-5	1,1,2,2-TETRACHLOROETHANE	ND	5.
127-18-4	TETRACHLOROETHYLENE	96.	5.
109-99-9	TETRAHYDROFURAN	ND	30.
108-88-3	TOLUENE	ND	5.
71-55-6	1,1,1-TRICHLOROETHANE	80.	5.
79-00-5	1,1,2-TRICHLOROETHANE	ND	5.
79-01-6	TRICHLOROETHYLENE	260.	5.
75-69-4	TRICHLOROFLUOROMETHANE	ND	5.
108-05-4	VINYL ACETATE	ND	30.
75-01-4	VINYL CHLORIDE	ND	30.
95-47-6	TOTAL XYLENES	ND	5.

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-3A
WCAS JOB #: 14122

UNITS: UG/L (PPB)

	COMPOUND NAME	FRACTION	APPROXIMATE CONCENTRATION
1	NONE FOUND	VOA	

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-2A
WCAS JOB #: 14122

DATE RECEIVED: 11/09/89 RUN NUMBER: 14122B3
DATE EXTRACTED: 11/13/89 SAMPLE AMOUNT: 1L:1ML
DATE ANALYZED: 11/17/89 MATRIX: WATER

SEMI-VOLATILE ORGANICS (EPA 625/8270) UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
83-32-9	ACENAPHTHENE	ND	1.
208-96-8	ACENAPHTHYLENE	ND	1.
120-12-7	ANTHRACENE	ND	1.
56-55-3	BENZO(A)ANTHRACENE	ND	1.
205-99-2	BENZO(B & K)FLUORANTHENES	ND	1.
191-24-2	BENZO(GHI)PERYLENE	ND	1.
50-32-8	BENZO(A)PYRENE	ND	1.
65-85-0	BENZOIC ACID	ND	5.
100-51-6	BENZYL ALCOHOL	ND	1.
111-91-1	BIS(2-CHLOROETHOXY)METHANE	ND	1.
111-44-4	BIS(2-CHLOROETHYL)ETHER	ND	1.
39638-32-9	BIS(2-CHLOROISOPROPYL)ETHER	ND	1.
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	ND	5.
101-55-3	4-BROMOPHENYL PHENYL ETHER	ND	1.
85-68-7	BUTYL BENZYL PHTHALATE	ND	1.
106-47-8	4-CHLOROANILINE	ND	1.
59-50-7	4-CHLORO-3-METHYLPHENOL	ND	1.
91-58-7	2-CHLORONAPHTHALENE	ND	1.
95-57-8	2-CHLOROPHENOL	ND	1.
7005-72-3	4-CHLOROPHENYL PHENYL ETHER	ND	1.
218-01-9	CHRYSENE	ND	1.
53-70-3	DIBENZO(A,H)ANTHRACENE	ND	1.
132-64-9	DIBENZOFURAN	ND	1.
84-74-2	DI-N-BUTYL PHTHALATE	ND	1.
95-50-1	1,2-DICHLOROBENZENE	ND	1.
541-73-1	1,3-DICHLOROBENZENE	ND	1.
106-46-7	1,4-DICHLOROBENZENE	ND	1.
91-94-1	3,3'-DICHLOROBENZIDINE	ND	2.
120-33-2	2,4-DICHLOROPHENOL	ND	1.
84-66-2	DIETHYL PHTHALATE	ND	1.
105-67-9	2,4-DIMETHYLPHENOL	ND	1.
131-11-3	DIMETHYL PHTHALATE	ND	1.
534-52-1	4,6-DINITRO-2-METHYLPHENOL	ND	5.
51-28-5	2,4-DINITROPHENOL	ND	5.
121-14-2	2,4-DINITROTOLUENE	ND	1.
606-20-2	2,6-DINITROTOLUENE	ND	1.
117-84-0	DI-N-OCTYL PHTHALATE	ND	1.
206-44-0	FLUORANTHENE	ND	1.
86-73-7	FLUORENE	ND	1.
118-74-1	HEXACHLOROBENZENE	ND	1.
87-68-3	HEXACHLOROBUTADIENE	ND	1.
77-47-4	HEXACHLOROCYCLOPENTADIENE	ND	1.
67-72-1	HEXACHLOROETHANE	ND	1.
193-39-5	INDENO(1,2,3-CD)PYRENE	ND	1.
78-59-1	ISOPHORONE	ND	1.
91-57-6	2-METHYLNAPHTHALENE	ND	1.

CLIENT: THORNE ENVIRONMENTAL
WCAS JOB #: 14122

SAMPLE: MW-2A

DATE RECEIVED: 11/09/89
DATE EXTRACTED: 11/13/89
DATE ANALYZED: 11/17/89

RUN NUMBER: 14122B3
SAMPLE AMOUNT: 1L:1ML
MATRIX: WATER

SEMI-VOLATILE ORGANICS (EPA 625/8270)

UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
95-48-7	2-METHYLPHENOL	ND	1.
106-44-5	4-METHYLPHENOL	ND	1.
91-20-3	NAPHTHALENE	ND	1.
88-74-4	2-NITROANILINE	ND	5.
99-09-2	3-NITROANILINE	ND	5.
100-01-6	4-NITROANILINE	ND	5.
98-95-3	NITROBENZENE	ND	1.
88-75-5	2-NITROPHENOL	ND	1.
100-02-7	4-NITROPHENOL	ND	5.
86-30-6	N-NITROSODIPHENYLAMINE	ND	1.
621-64-7	N-NITROSODIPROPYLAMINE	ND	1.
87-86-5	PENTACHLOROPHENOL	ND	5.
85-01-8	PHENANTHRENE	ND	1.
108-95-2	PHENOL	ND	1.
129-00-0	PYRENE	ND	1.
120-82-1	1,2,4-TRICHLOROBENZENE	ND	1.
95-95-4	2,4,5-TRICHLOROPHENOL	ND	5.
88-06-2	2,4,6-TRICHLOROPHENOL	ND	1.

** - Cannot be separated from diphenylamine

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-2A
WCAS JOB #: 14122

UNITS: UG/L (PPB)

	COMPOUND NAME	FRACTION	APPROXIMATE CONCENTRATION
1	C10-C16 HYDROCARBON MATRIX	BNA	8000.
2	C18-C35 HYDROCARBON MATRIX	BNA	1000.
3	NONYLPHENOLS	BNA	30.
4	UNIDENTIFIED COMPOUNDS	BNA	20.

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-3A
WCAS JOB #: 14122

DATE RECEIVED: 11/09/89 RUN NUMBER: 14122B2
DATE EXTRACTED: 11/13/89 SAMPLE AMOUNT: 1L:1ML
DATE ANALYZED: 11/17/89 MATRIX: WATER

SEMI-VOLATILE ORGANICS (EPA 625/8270) UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
83-32-9	ACENAPHTHENE	ND	1.
208-96-8	ACENAPHTHYLENE	ND	1.
120-12-7	ANTHRACENE	ND	1.
56-55-3	BENZO(A)ANTHRACENE	ND	1.
205-99-2	BENZO(B & K)FLUORANTHENES	ND	1.
191-24-2	BENZO(GHI)PERYLENE	ND	1.
50-32-8	BENZO(A)PYRENE	ND	1.
65-85-0	BENZOIC ACID	ND	5.
100-51-6	BENZYL ALCOHOL	ND	1.
111-91-1	BIS(2-CHLOROETHOXY)METHANE	ND	1.
111-44-4	BIS(2-CHLOROETHYL)ETHER	ND	1.
39638-32-9	BIS(2-CHLOROISOPROPYL)ETHER	ND	1.
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	ND	5.
101-55-3	4-BROMOPHENYL PHENYL ETHER	ND	1.
85-68-7	BUTYL BENZYL PHTHALATE	ND	1.
106-47-8	4-CHLOROANILINE	ND	1.
59-50-7	4-CHLORO-3-METHYLPHENOL	ND	1.
91-58-7	2-CHLORONAPHTHALENE	ND	1.
95-57-8	2-CHLOROPHENOL	ND	1.
7005-72-3	4-CHLOROPHENYL PHENYL ETHER	ND	1.
218-01-9	CHRYSENE	ND	1.
53-70-3	DIBENZO(A,H)ANTHRACENE	ND	1.
132-64-9	DIBENZOFURAN	ND	1.
84-74-2	DI-N-BUTYL PHTHALATE	ND	1.
95-50-1	1,2-DICHLOROBENZENE	ND	1.
541-73-1	1,3-DICHLOROBENZENE	ND	1.
106-46-7	1,4-DICHLOROBENZENE	ND	1.
91-94-1	3,3'-DICHLOROBENZIDINE	ND	2.
120-33-2	2,4-DICHLOROPHENOL	ND	1.
84-66-2	DIETHYL PHTHALATE	ND	1.
105-67-9	2,4-DIMETHYLPHENOL	ND	1.
131-11-3	DIMETHYL PHTHALATE	ND	1.
534-52-1	4,6-DINITRO-2-METHYLPHENOL	ND	5.
51-28-5	2,4-DINITROPHENOL	ND	5.
121-14-2	2,4-DINITROTOLUENE	ND	1.
606-20-2	2,6-DINITROTOLUENE	ND	1.
117-84-0	DI-N-OCTYL PHTHALATE	ND	1.
206-44-0	FLUORANTHENE	ND	1.
86-73-7	FLUORENE	ND	1.
118-74-1	HEXACHLOROBENZENE	ND	1.
87-68-3	HEXACHLOROBUTADIENE	ND	1.
77-47-4	HEXACHLOROCYCLOPENTADIENE	ND	1.
67-72-1	HEXACHLOROETHANE	ND	1.
193-39-5	INDENO(1,2,3-CD)PYRENE	ND	1.
78-59-1	ISOPHORONE	ND	1.
91-57-6	2-METHYLNAPHTHALENE	ND	1.

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-3A
WCAS JOB #: 14122

DATE RECEIVED: 11/09/89 RUN NUMBER: 14122B2
DATE EXTRACTED: 11/13/89 SAMPLE AMOUNT: 1L:1ML
DATE ANALYZED: 11/17/89 MATRIX: WATER

SEMI-VOLATILE ORGANICS (EPA 625/8270) UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
95-48-7	2-METHYLPHENOL	ND	1.
106-44-5	4-METHYLPHENOL	ND	1.
91-20-3	NAPHTHALENE	ND	1.
88-74-4	2-NITROANILINE	ND	5.
99-09-2	3-NITROANILINE	ND	5.
100-01-6	4-NITROANILINE	ND	5.
98-95-3	NITROBENZENE	ND	1.
88-75-5	2-NITROPHENOL	ND	1.
100-02-7	4-NITROPHENOL	ND	5.
86-30-6	N-NITROSODIPHENYLAMINE	ND	1.
621-64-7	N-NITROSODIPROPYLAMINE	ND	1.
87-86-5	PENTACHLOROPHENOL	ND	5.
85-01-8	PHENANTHRENE	ND	1.
108-95-2	PHENOL	ND	1.
129-00-0	PYRENE	ND	1.
120-82-1	1,2,4-TRICHLOROBENZENE	ND	1.
95-95-4	2,4,5-TRICHLOROPHENOL	ND	5.
88-06-2	2,4,6-TRICHLOROPHENOL	ND	1.

** - Cannot be separated from diphenylamine

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT: THORNE ENVIRONMENTAL SAMPLE: MW-3A
WCAS JOB #: 14122

UNITS: UG/L (PPB)

	COMPOUND NAME	FRACTION	APPROXIMATE CONCENTRATION
1	UNIDENTIFIED COMPOUNDS	BNA	10.

Data Reporting Qualifiers

Value - If the result is a value greater than or equal to the Detection Limit (DL), the value is reported.

ND - Indicates that the compound was analyzed for but not detected. The minimum DL for the sample with the ND is reported based on necessary concentration or dilution actions.

TR - Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified DL but greater than zero.

MED-TOX ASSOCIATES, INC.
ANALYTICAL REQUEST/CHAIN OF CUSTODY FORM
(Complete Information on Opposite Side)

CLIENT Thorne Environmental
CLIENT JOB REF.: TE 1066-008
LAB PROJECT NO: _____ (lab use only)

Date: 11/10/89
SAMPLER(S): Patty Reimers

CLIENT SAMPLE IDENTIFICATION	DATE	Lab Number (lab use only)	AIR VOLUME (Liters)	NO. CONT.	SAMPLE TYPE *	EPA 8015 modified for 10ppb	EPA 624	EPA 625	COMMENTS/ INTERFERENCES
MW-2 Field Blank	11/10/89	✓	1 liter	1	Water		✓		
MW-2 Field Blank	✓		VOA			✓			
MW-2A ✓			1 liter				✓	✓	Test "A" samples only
MW-2A ✓			VOA			✓			
MW-2B ✓			1 liter						
MW-2B ✓			VOA						
MW-3A ✓			1 liter			[redacted]	✓	✓	
MW-3A ✓			VOA			✓			
MW-3B ✓			1 liter						
MW-3B ✓			VOA						
	↓			↓	↓				

M14122

Relinquished by (Signature): Patty Reimers	Date: 11/10/89	Time: 2:00	Received by (Signature): Daniel Gilbertson WCAS M1412	Date: 11/9/89	Time: 2:15
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Dispatched by: (Signature)	Date	Time	Received for lab by: (Signature)	Date	Time
Method of Shipment:			Lab Comments:		

*SAMPLE TYPE (SPECIFY): (1) 37 mm 0.8 um MCEF; 2) 25 mm 0.8 um MCEF; (3) 25 mm 0.4 um polycarb. filter; (4) PVC filter, diam. ____ pore size ____; (5) Charcoal tube; (6) Silica gel tube (7) Water; (8) Soil; (9) Bulk Sample; (10) Other [redacted] (11) Other [redacted]

APPENDIX C

VAPOR EXTRACTION FEASIBILITY TEST RESULTS

MED-TOX ASSOCIATES, INC.

ENVIRONMENTAL & OCCUPATIONAL HEALTH SERVICES

3440 Vincent Road Pleasant Hill, CA 94523 • (415) 930-9090 • FAX# (415) 930-0256

LABORATORY ANALYSIS REPORT

THORNE ENVIRONMENTAL INC.
4887 E. LA PALMA AVENUE
SUITE 701
ANAHEIM, CA 92807
ATTN: FRITZ REIMERS

REPORT DATE: 12/05/89

DATE SAMPLED: 11/16/89
DATE RECEIVED: 11/21/89
DATE ANALYZED: 11/29/89

CLIENT JOB NO: 1E-1066

MED-TOX JOB NO: 8911133

ANALYSIS OF: TWO CHARCOAL TUBE SAMPLES FOR BTXE AND TOTAL PETROLEUM HYDROCARBONS

Sample Identification Client Id.	Lab No.	Sample Volume (L)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Total Xylenes (ppm)	Total Petroleum Hydrocarbons as Kerosene (mg/m^3)
#1	01A	10	<2	<1	<0.5	<2	860
#2	02A	10	<2	<0.8	<0.5	<2	920
NIOSH Method			1501	1501	1501	1501	1550

Instrument: #3

< = Less than; below the reliable limit of detection

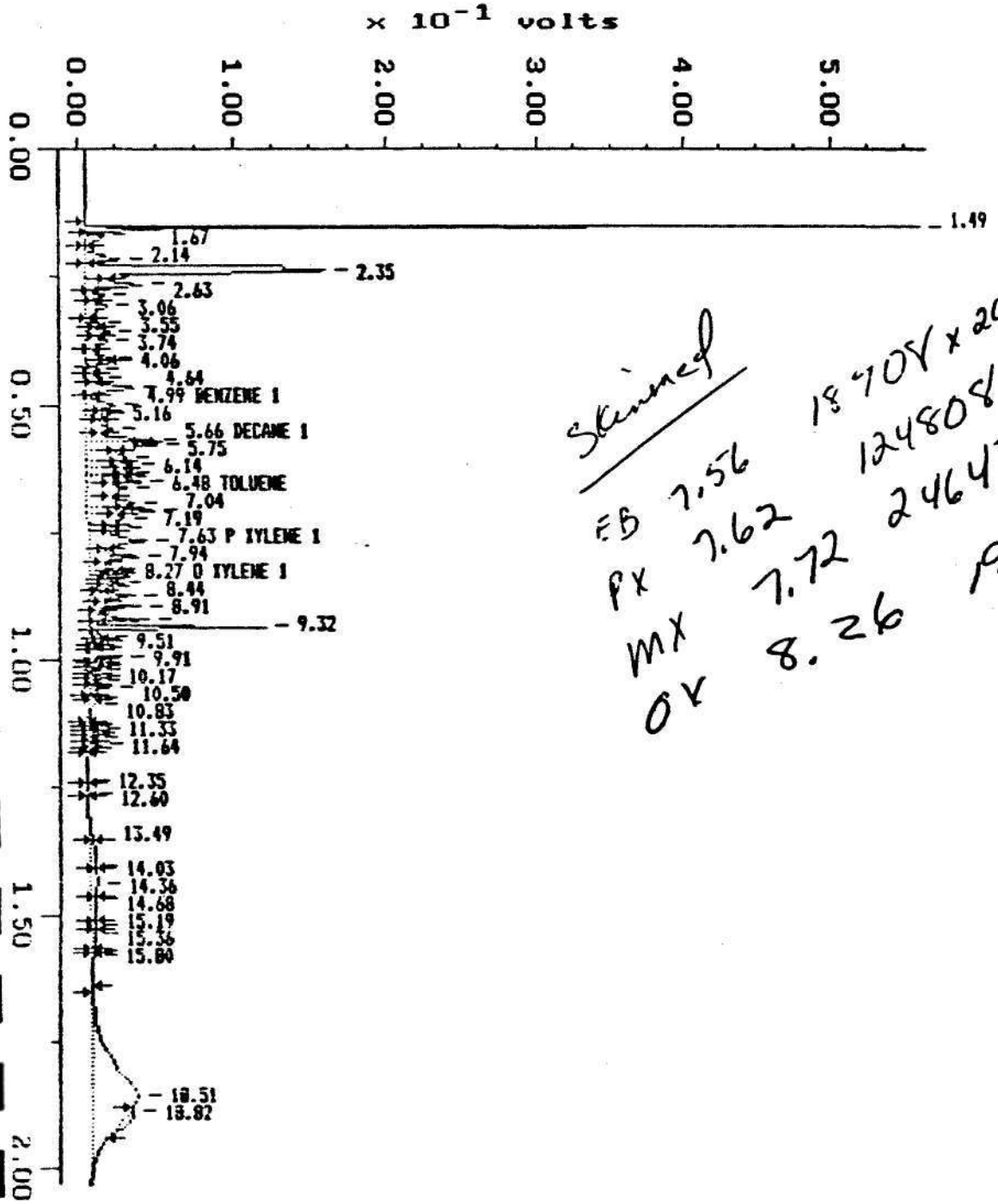
Michael Lynch

Michael Lynch, Manager
Organic Laboratory

Results FAXed to Mike Sajadi & Fritz Reimers 12/05/89

Sample

Sample: 11133-1A F Channel: FID MAX Filename: D112930
Acquired: 23-NOV-89 23:04 Method: D:\MAX\DATA3\TPHBTX Operator:
Dilutions: 1 : 4.000



skimmed

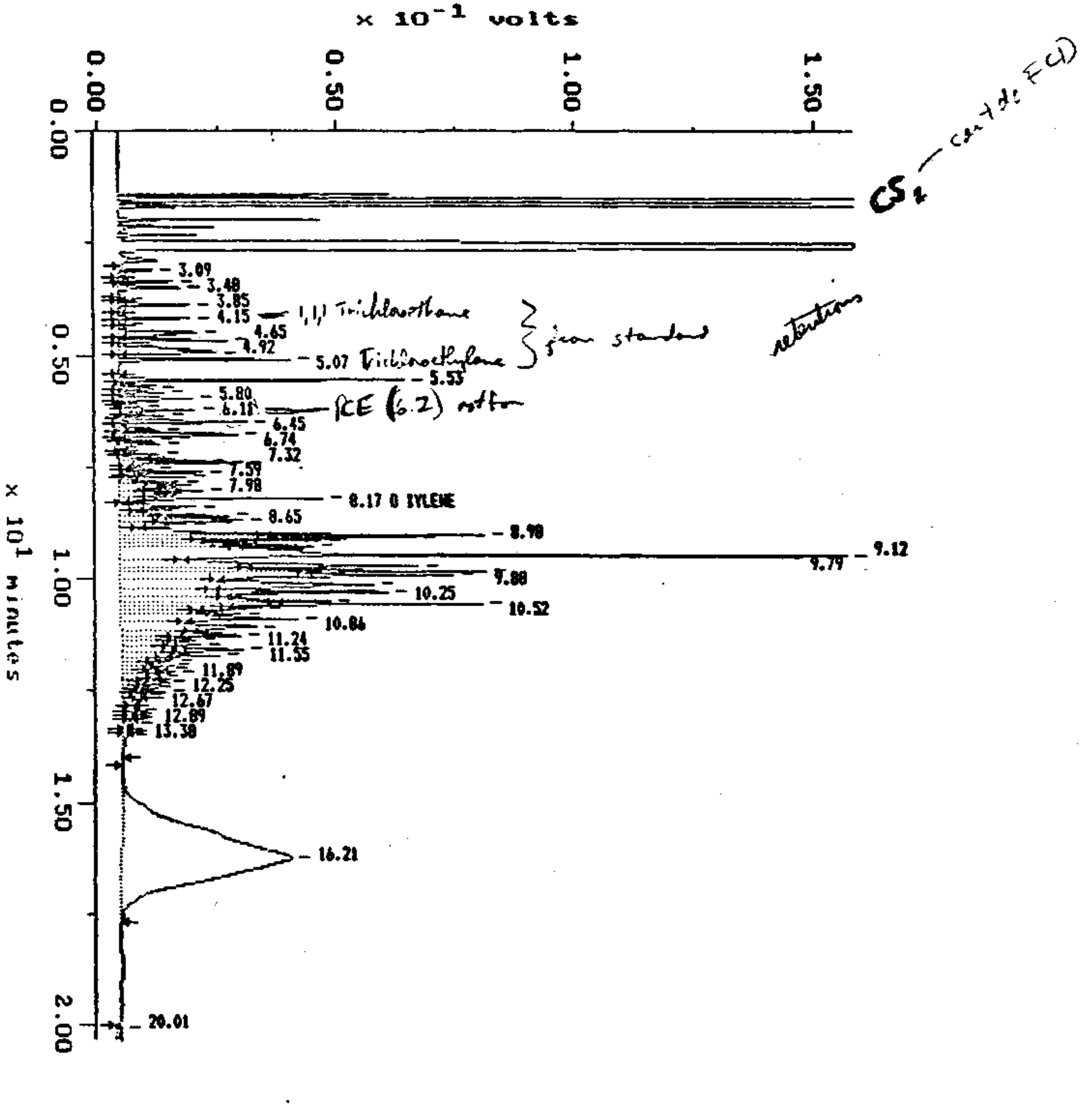
EB 7.56 18.70Y x 20.375 E-5 = 3.8 x 4 = 15

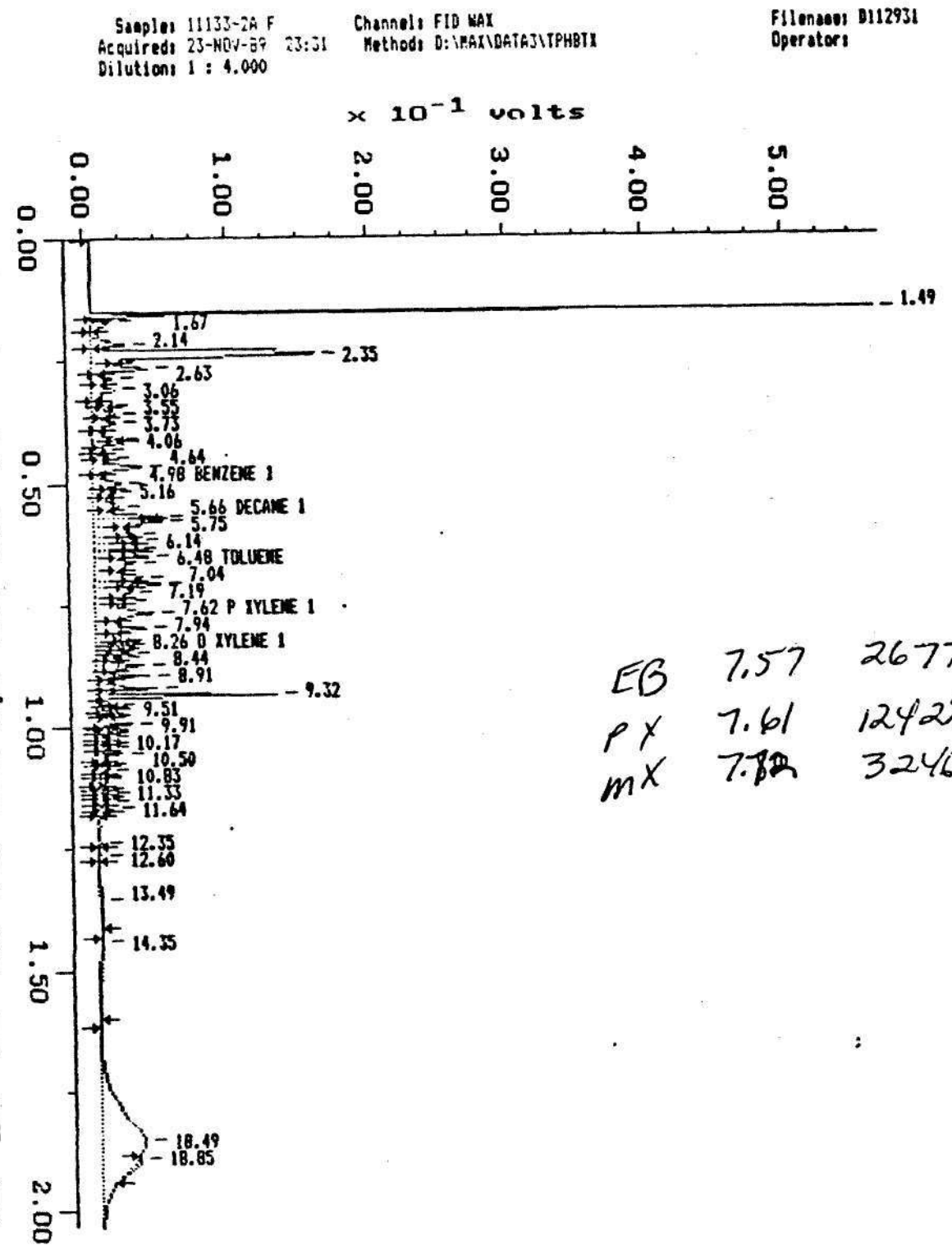
PX 7.62 124808

MX 7.72 24643 x 18.878 E-5 x 4 = 19

OX 8.26 19606 =

Sample: 11133-1A F   Channel: FID DB-5 column   Filename: D112930
Acquired: 23-NOV-89 23:04   Method: D:\MAX\DATA3\TPHBTX   Operator:
Dilution: 1 : 4.000





EB 7.57 $26777 \times 20.375E^{-5} \times 4 = 21$

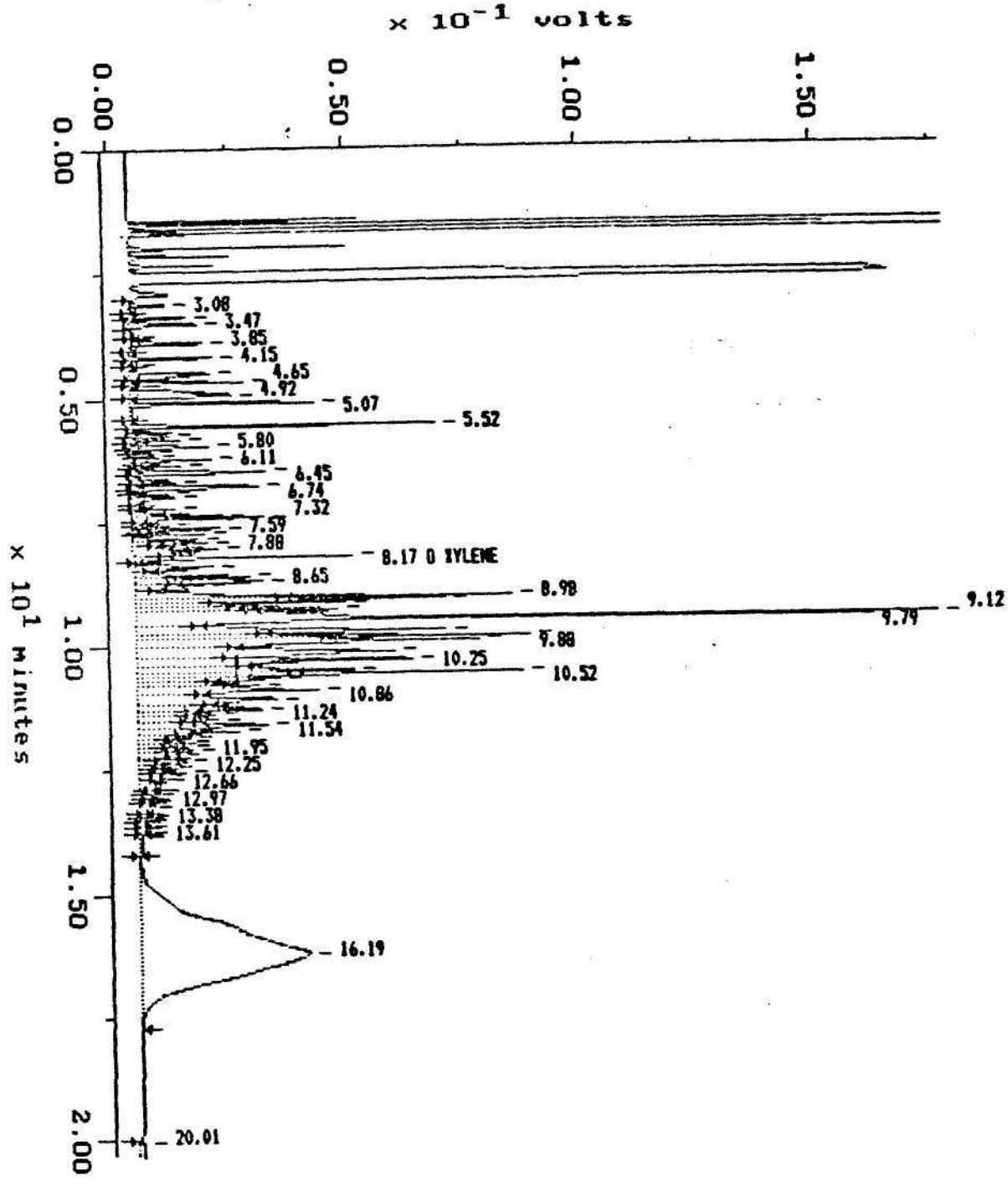
PX 7.61 $12422 \times 20.196E^{-5} \times 4 =$

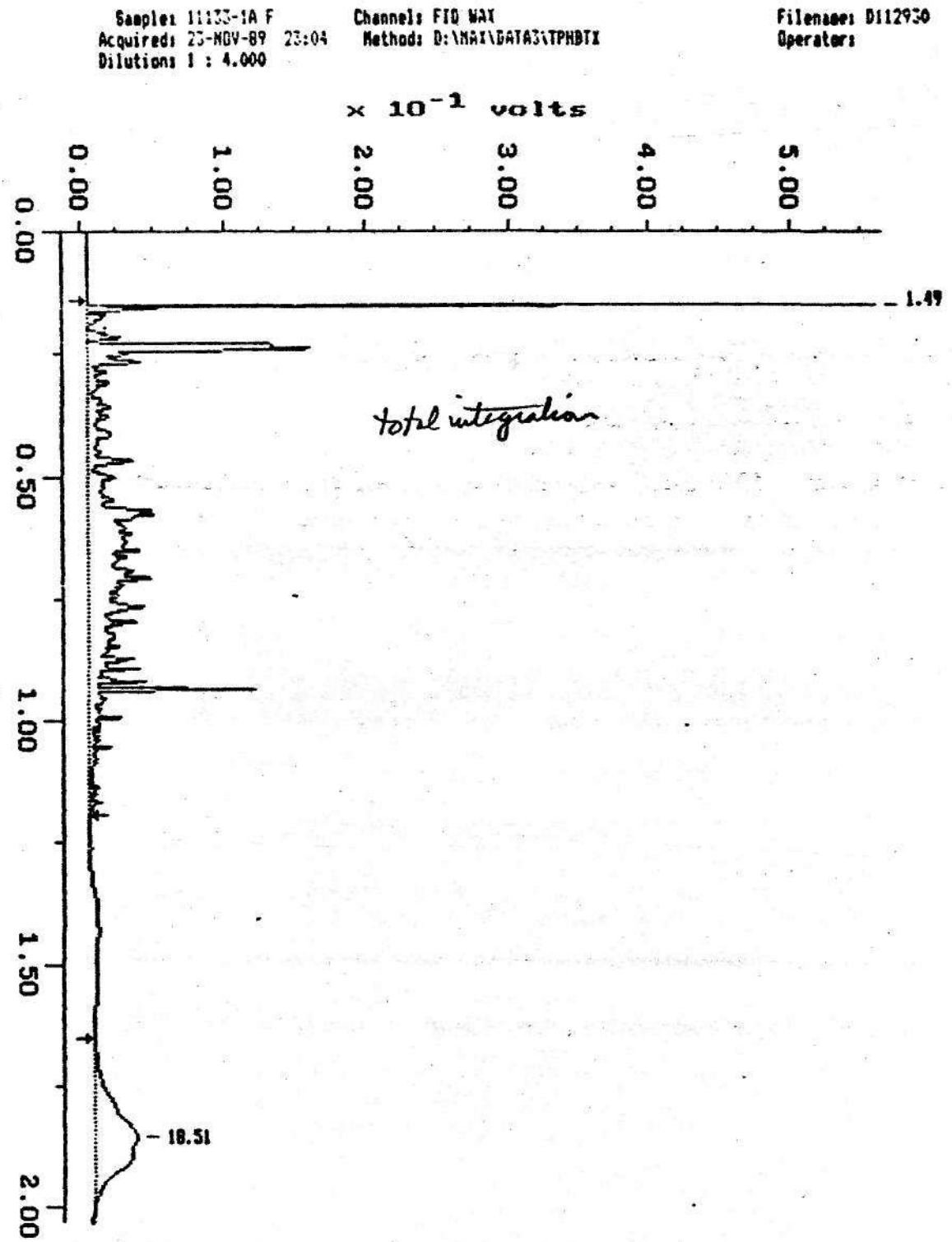
mX 7.82 $32463 \times 19.878E^{-5} \times 4 = 25$

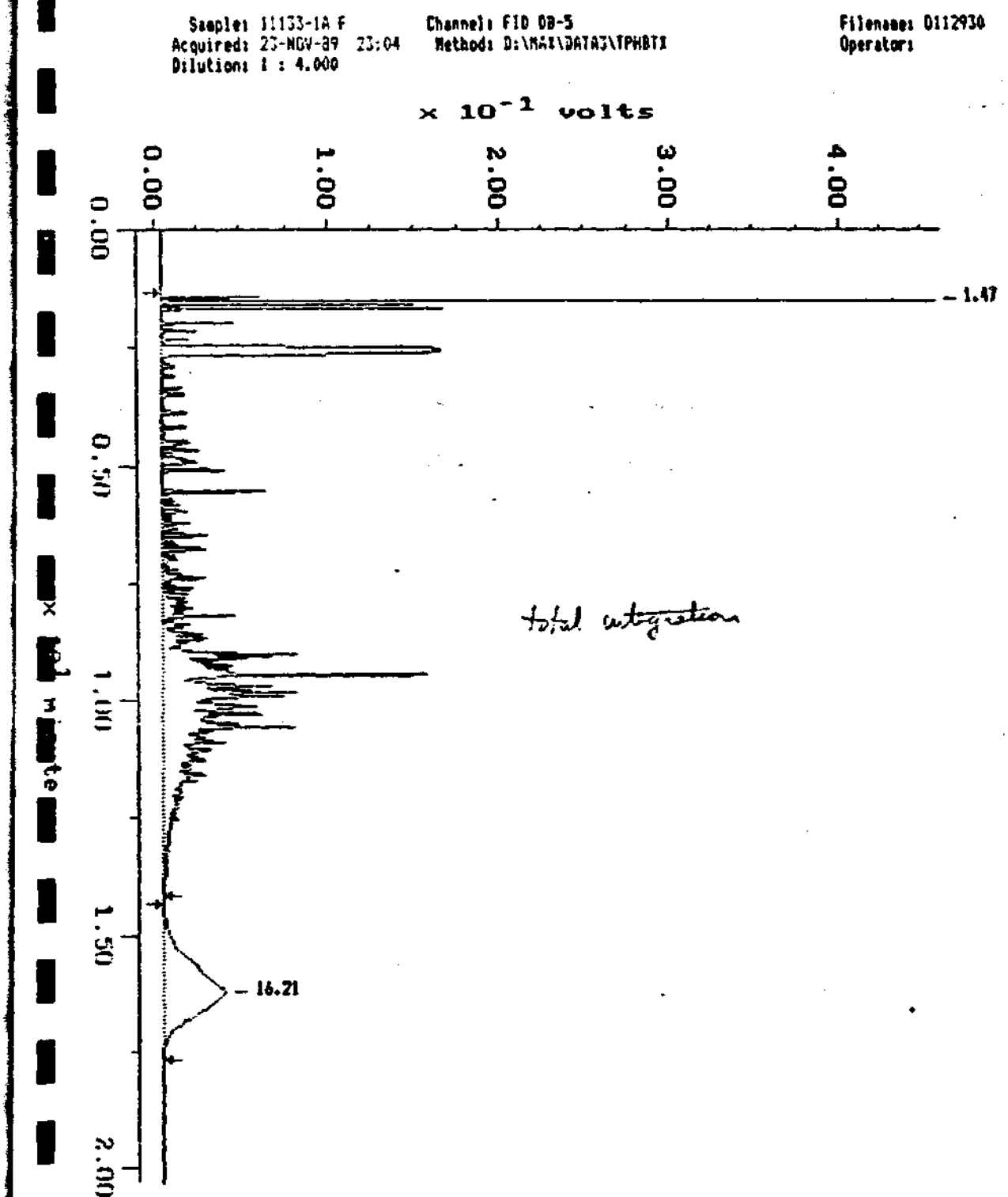
Sample: 11133-2A F
Acquired: 25-NOV-89 23:31
Dilution: 1 : 4.000

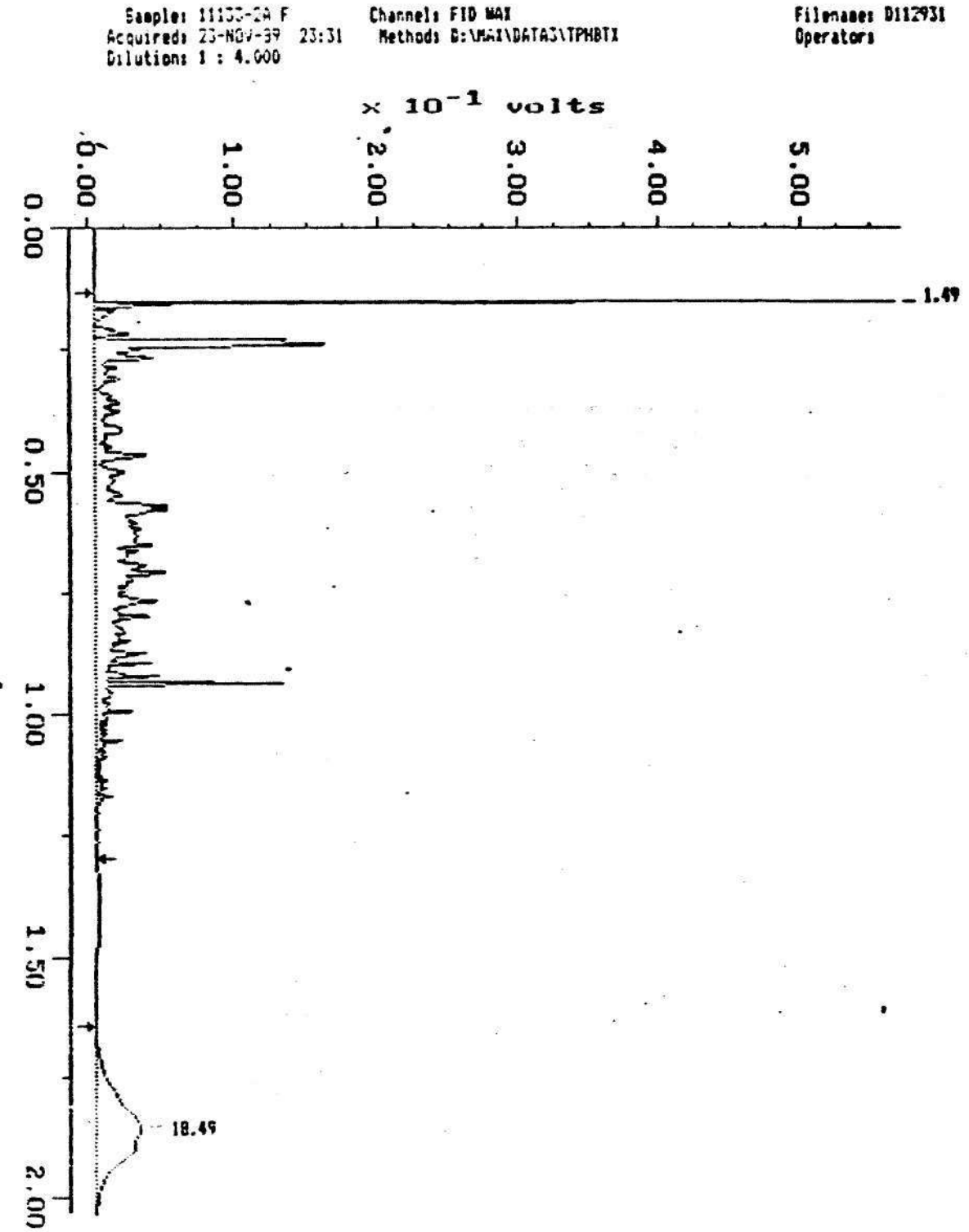
Channel: FID DB-5
Method: D:\MAX\DATA3\TPHBTX

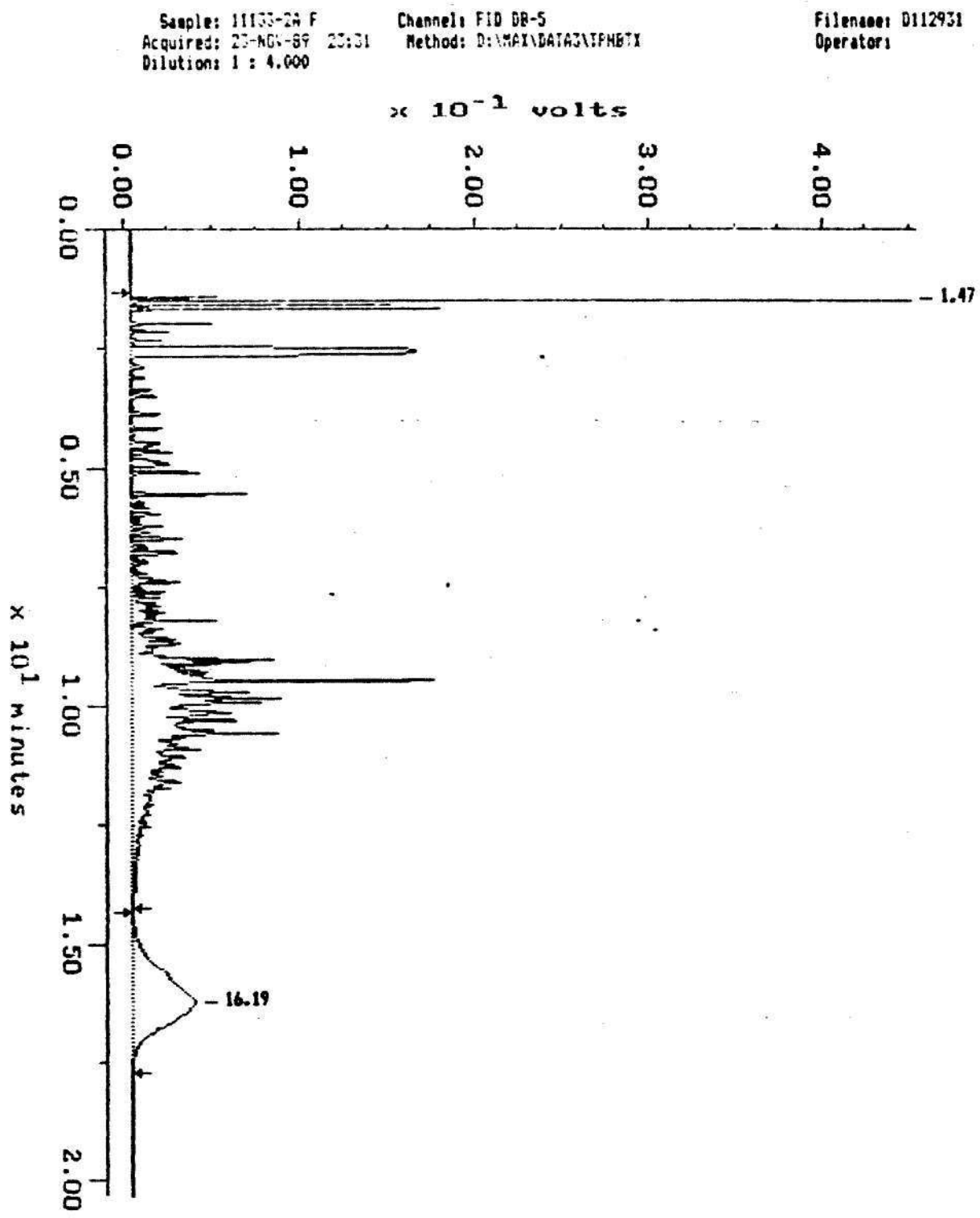
Filename: D112931
Operator:

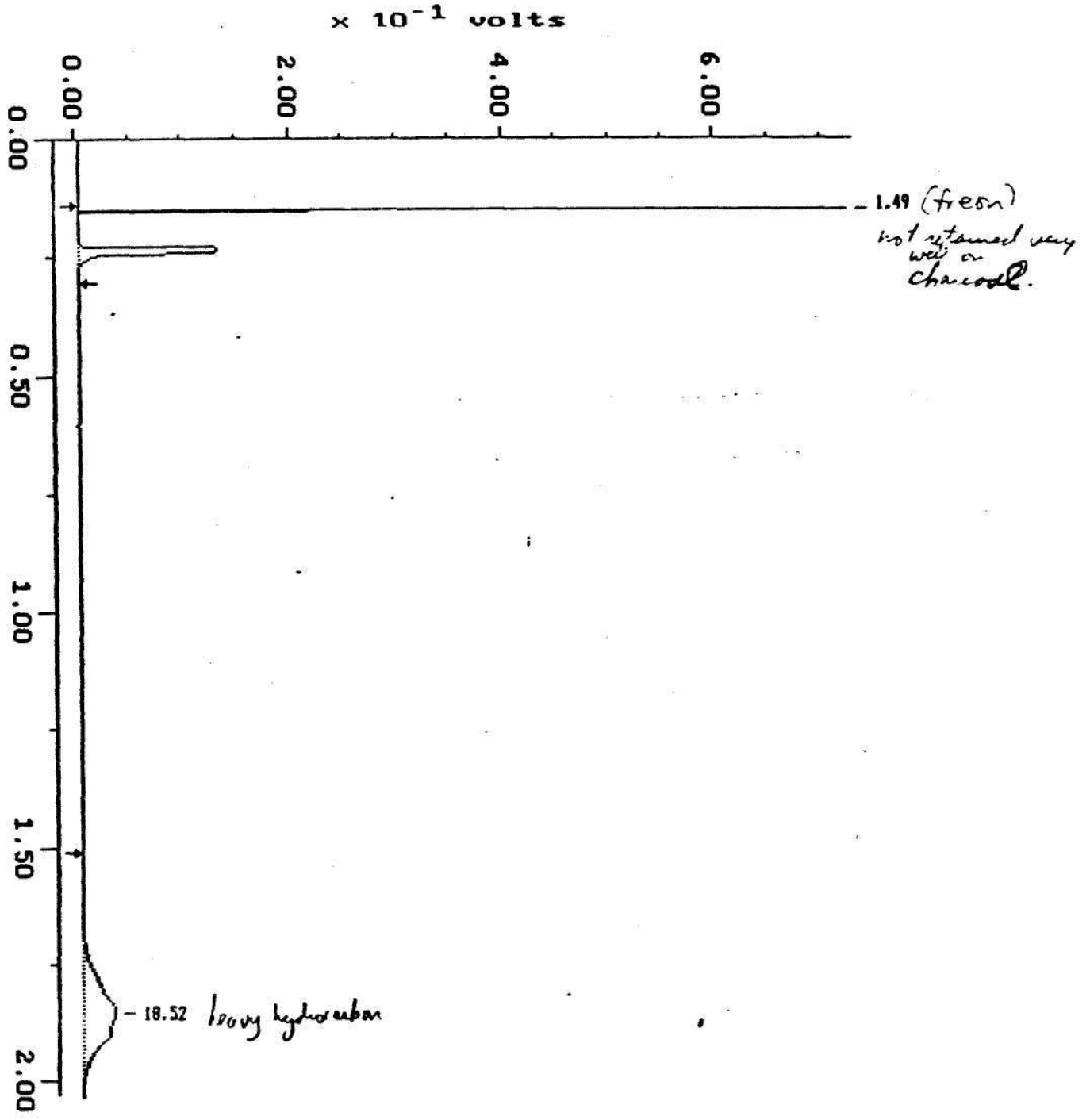


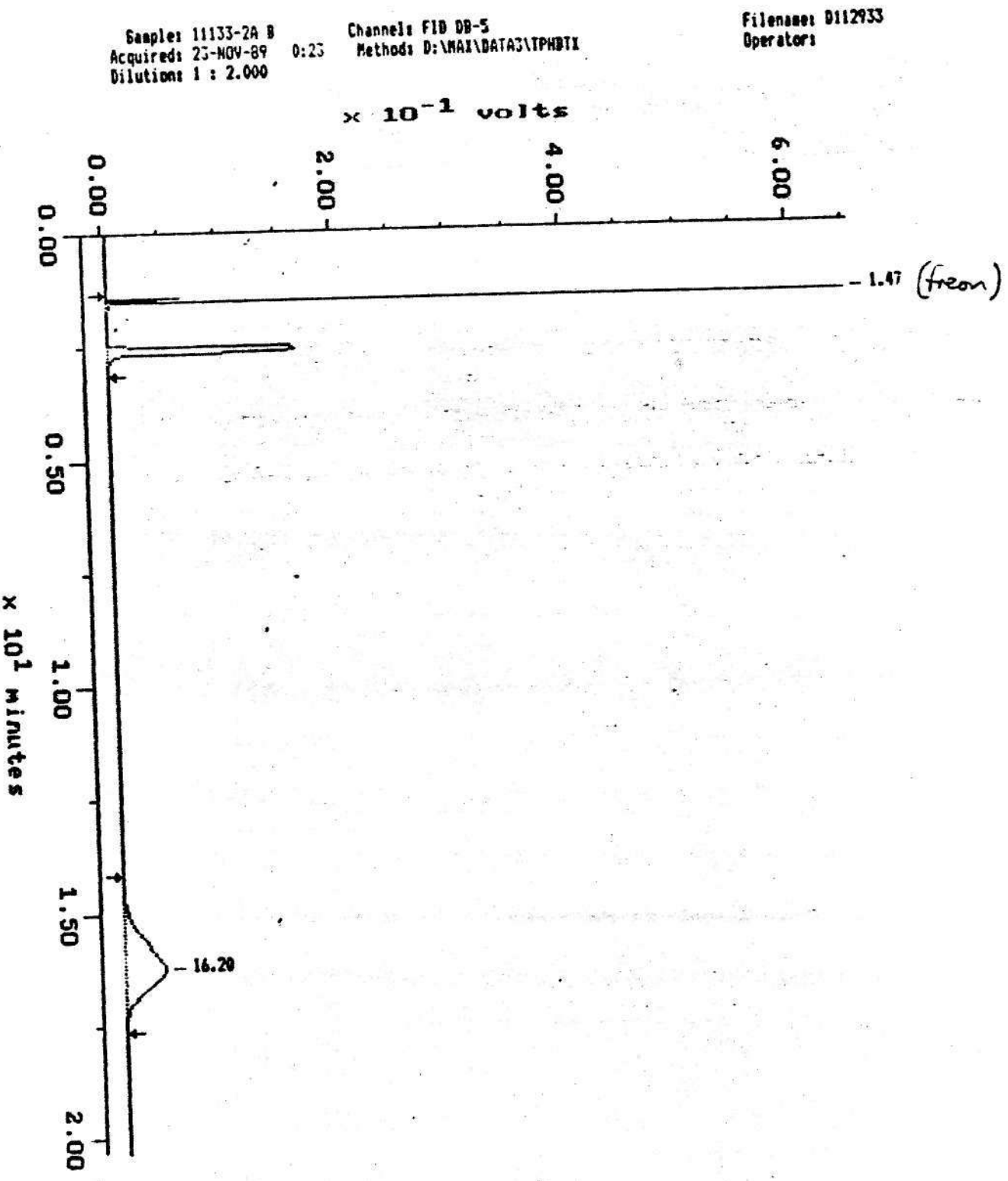

Sample: 11133-1A F
Acquired: 23-NOV-89 23:04
Dilutions: 1 : 4.000
Channel: FID WAX
Method: D:\HAI\DATA3\TPHBTX
Filename: D112930
Operator:
x 10⁻¹ volts
0.00
1.00
2.00
3.00
4.00
5.00
1.49
total integration
18.51
x 10¹ minutes
0.00
0.50
1.00
1.50
2.00

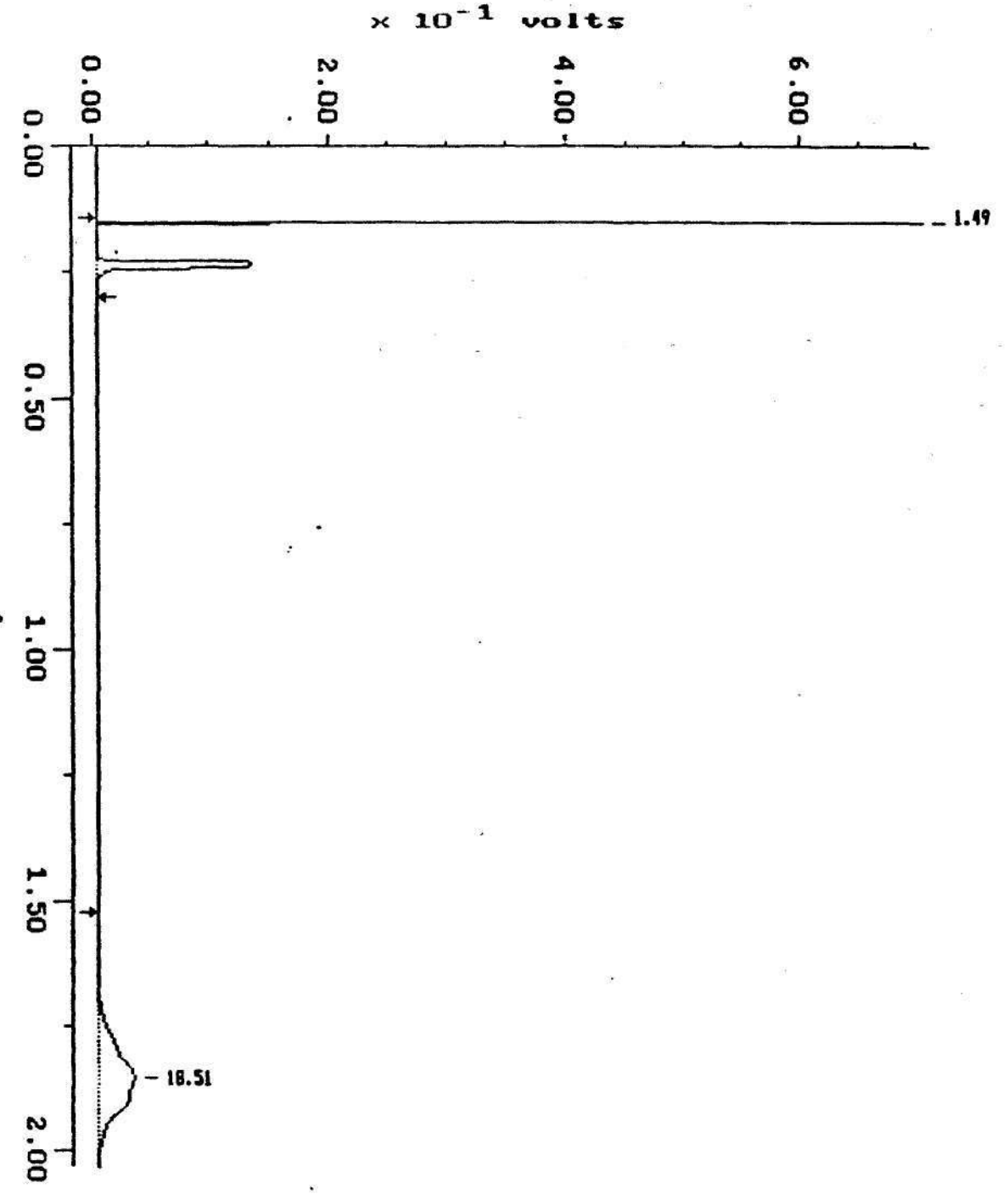

Sample: 11133-1A F
Acquired: 23-NOV-89 23:04
Dilution: 1 : 4.000
Channel: FID 0B-5
Method: D:\MAI\DATA3\TPHBTX
Filename: 0112930
Operator:
x 10⁻¹ volts
0.00
1.00
2.00
3.00
4.00
0.00
0.50
1.00
1.50
2.00
x 10¹ minute
1.47
16.21
total integration

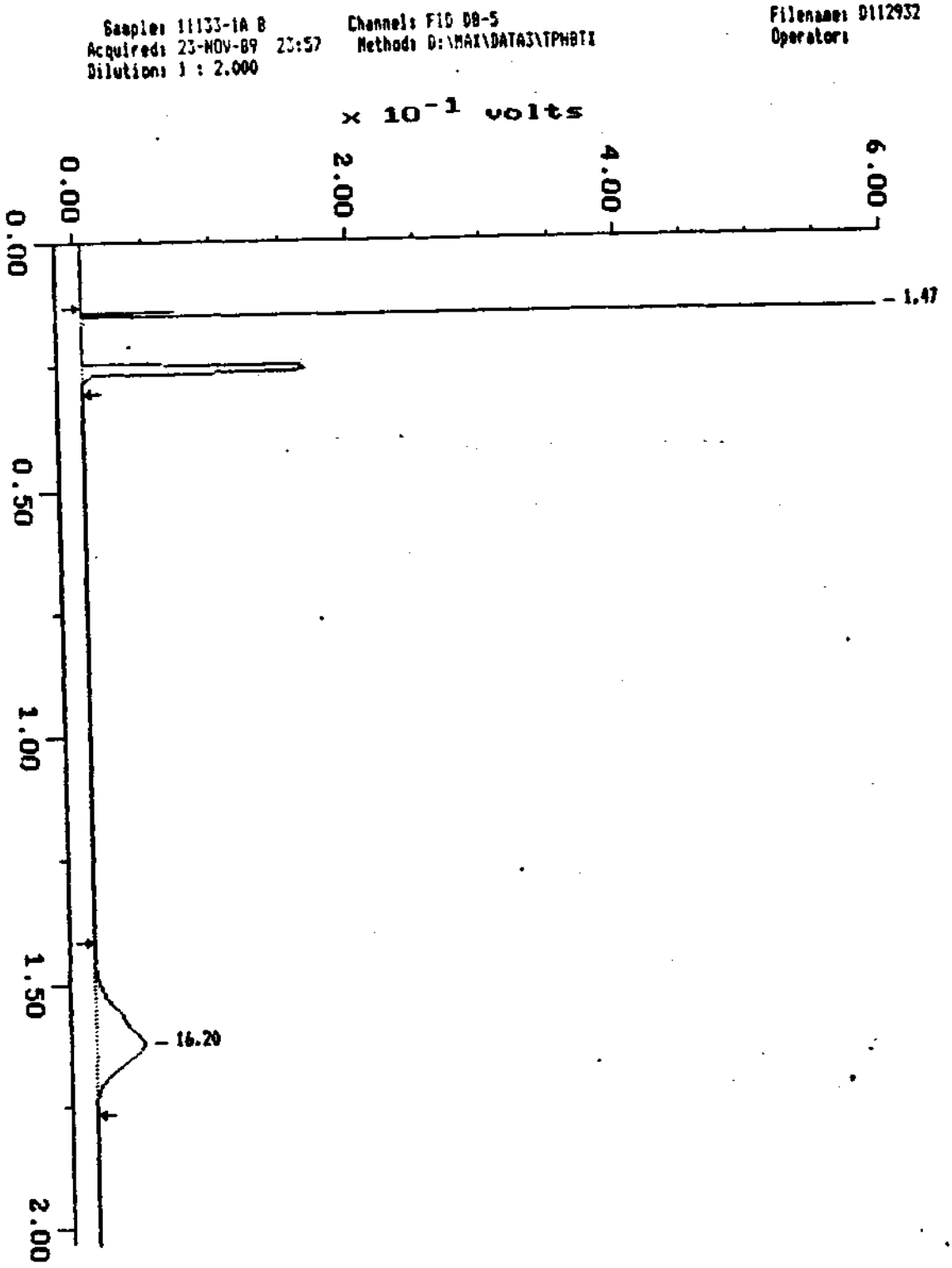

Sample: 11133-2A F
Acquired: 23-NOV-89 23:31
Dilution: 1 : 4.000
Channel: FID MAX
Method: B:\MAX\DATA3\TPHBTX
Filename: D112931
Operator:
x 10⁻¹ volts
0.00
1.00
2.00
3.00
4.00
5.00
1.49
18.49
0.00
0.50
1.00
1.50
2.00
x 10¹ minutes


Sample: 11133-2A F
Acquired: 23-NOV-89 23:31
Dilution: 1 : 4.000
Channel: FID DB-5
Method: D:\MAI\DATA3\TPHBTX
Filename: D112931
Operator:
x 10⁻¹ volts
0.00
1.00
2.00
3.00
4.00
1.47
16.19
x 10¹ minutes
0.00
0.50
1.00
1.50
2.00

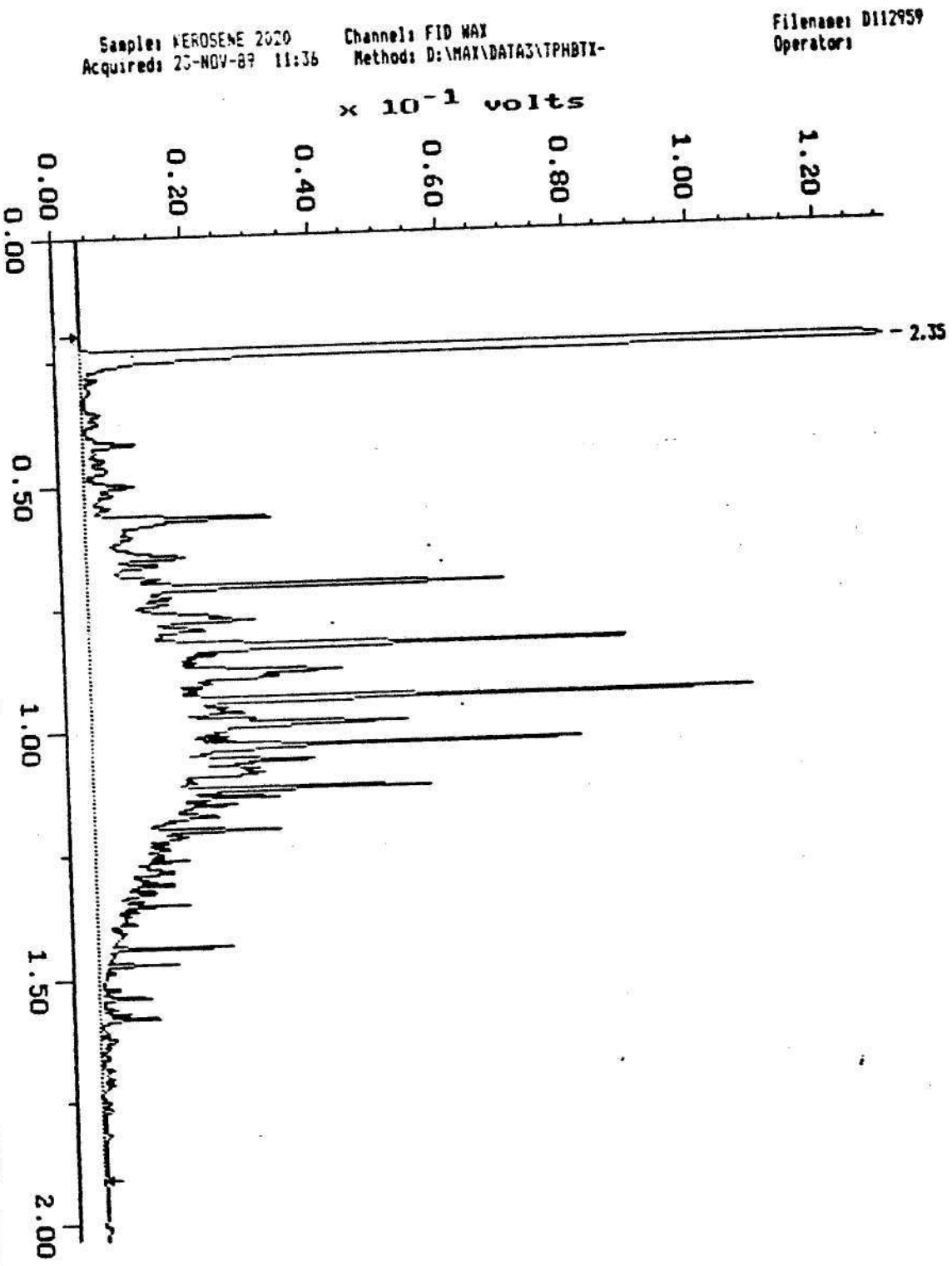

Sample: 11133-2A R
Acquired: 25-NOV-87 0:25
Dilution: 1 : 2.000
Channel: FID WAX
Method: D:\WAX\DATA3\TPHBTX
Filename: B112935
Operator:
x 10⁻¹ volts
0.00
2.00
4.00
6.00
0.00
0.50
1.00
1.50
2.00
x 10¹ minutes
1.49 (freon)
not retained very well on charcoal.
18.52 heavy hydrocarbon

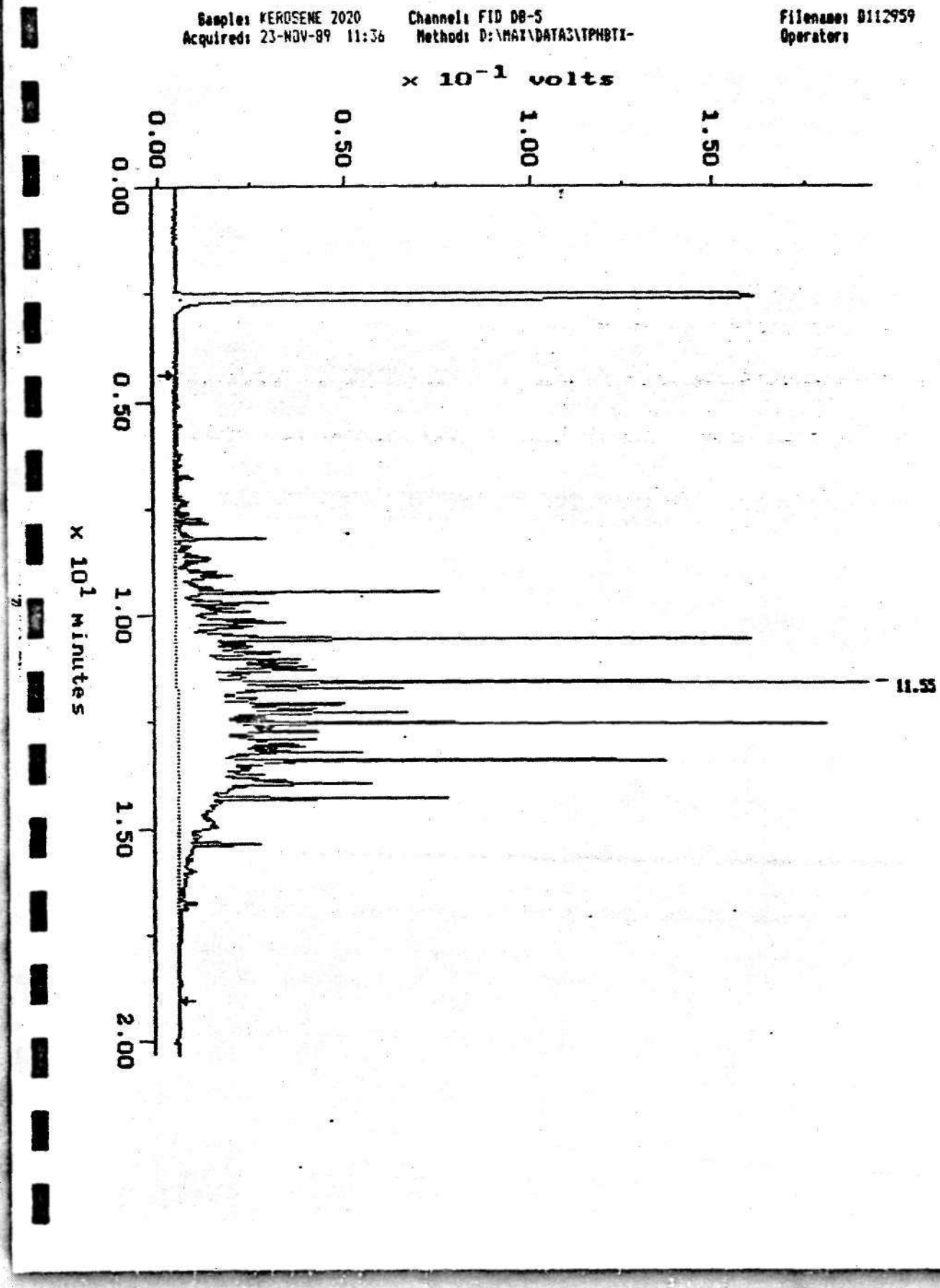

Sample: 11133-2A B
Acquired: 25-NOV-89 0:23
Dilution: 1 : 2.000
Channel: FID DB-5
Method: D:\MAI\DATA3\TPHBTX
Filename: D112933
Operator:
x 10⁻¹ volts
0.00
2.00
4.00
6.00
0.00
0.50
1.00
1.50
2.00
x 10¹ minutes
1.47 (freon)
16.20


Sample: 11133-1A B
Acquired: 23-NOV-89 23:57
Dilution: 1 : 2.000
Channel: FID WAX
Method: D:\MAX\BATCH\TPHETX
Filename: D112932
Operator:
x 10⁻¹ volts
0.00
2.00
4.00
6.00
1.49
18.51
x 10¹ minutes
0.00
0.50
1.00
1.50
2.00


Sample: 11133-1A B
Acquired: 23-NOV-89 23:57
Dilution: 1 : 2.000
Channel: FID 08-5
Method: D:\MAX\DATA3\TPHBTX
Filename: D112932
Operator:
x 10⁻¹ volts
0.00
2.00
4.00
6.00
0.00
0.50
1.00
1.50
2.00
x 10¹ minutes
1.47
16.20

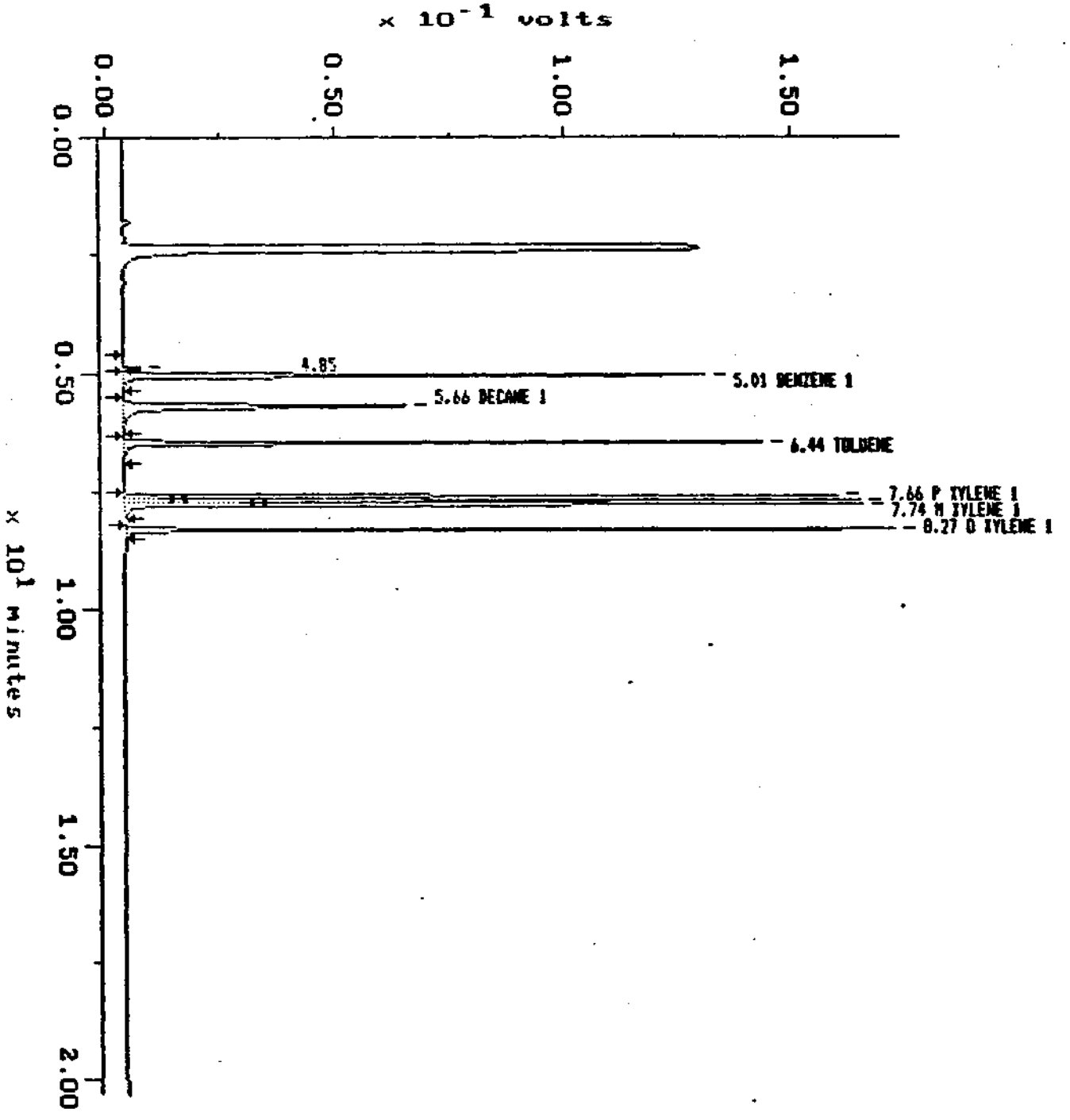
Standard

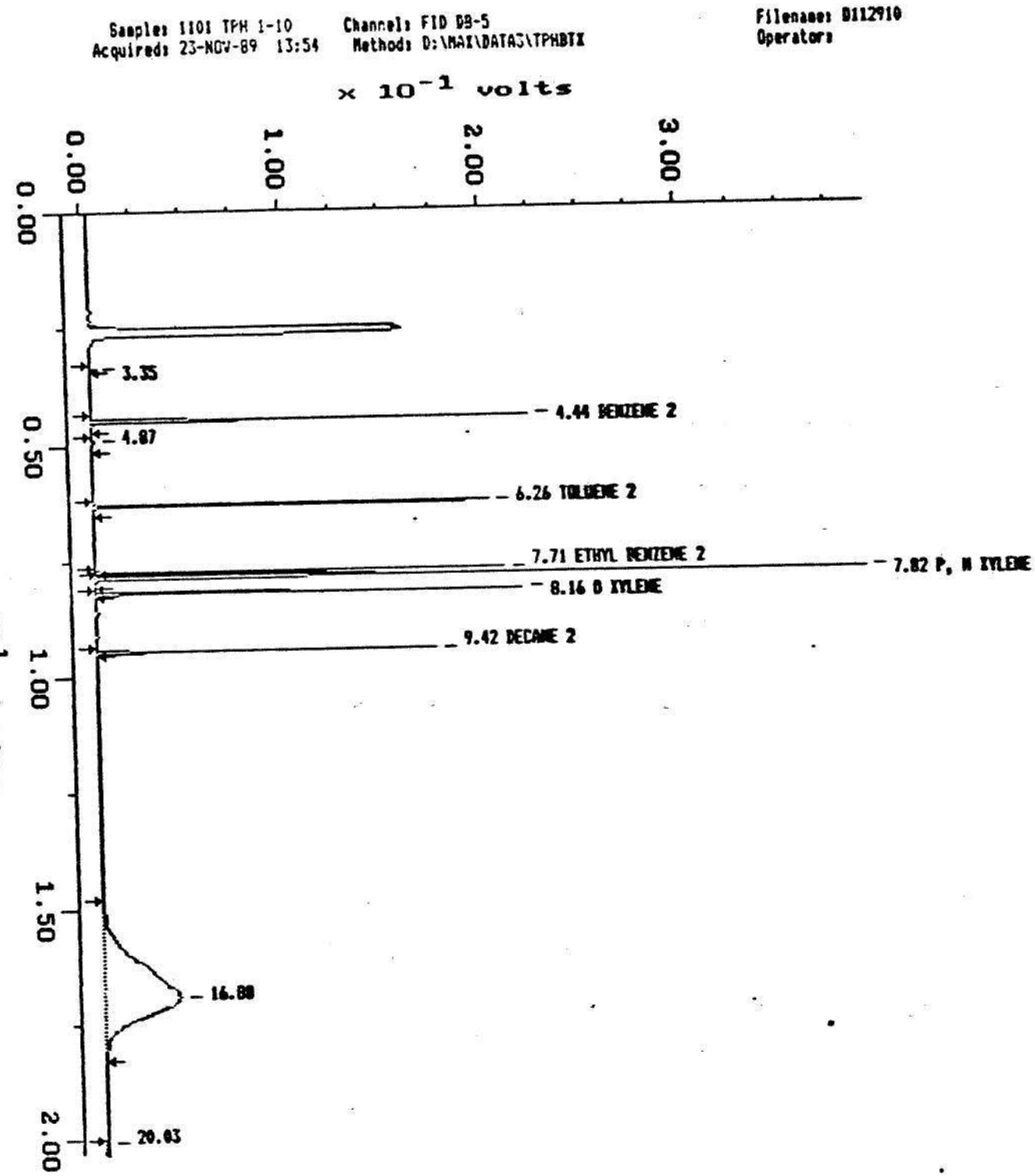

Sample: KEROSENE 2020
Acquired: 23-NOV-89 11:36
Channel: FID MAX
Method: D:\MAX\DATA3\TPHBTX-
Filename: D112959
Operator:
x 10⁻¹ volts
0.00
0.20
0.40
0.60
0.80
1.00
1.20
2.35
0.50
1.00
1.50
2.00
minutes


Sample: KEROSENE 2020
Acquired: 23-NOV-89 11:36
Channel: FID DB-5
Method: D:\MAI\DATA3\TPHBTI-
Filename: B112959
Operator:
x 10⁻¹ volts
0.00
0.50
1.00
1.50
x 10¹ minutes
0.00
0.50
1.00
1.50
2.00
11.55

aromatic standard

Sample: 1101 TPH 1-10 Channel: FID WAX Filename: B112910
Acquired: 23-NOV-89 13:54 Method: D:\MAF\DATA3\TPHBTX Operator:




Sample: 1101 TPH 1-10
Acquired: 23-NOV-89 13:54
Channel: FID DB-5
Method: D:\MAI\DATA3\TPHBTX
Filename: B112910
Operator:
x 10⁻¹ volts
0.00
1.00
2.00
3.00
0.00
0.50
1.00
1.50
2.00
x 10¹ Minutes
3.35
4.44 BENZENE 2
4.87
6.26 TOLUENE 2
7.71 ETHYL BENZENE 2
7.82 P, M XYLENE
8.16 O XYLENE
9.42 DECANE 2
16.80
20.03

MED-TOX ASSOCIATES, INC.
ANALYTICAL REQUEST/CHAIN OF CUSTODY FORM
(Complete Information on Opposite Side)

Date: 11/17/89

CLIENT Thorne Environmental
CLIENT JOB REF.: UE-1066
LAB PROJECT NO: 8911133
(lab use only)

SAMPLER(S): Mike SAJADI

CLIENT SAMPLE IDENTIFICATION	DATE	Lab Number (lab use only)	AIR VOLUME (Liters)	NO. CONT.	SAMPLE TYPE *	ANALYSES: BTXE/TPH	COMMENTS/ INTERFERENCES
#1	11/11	01A	10		SKC Tube	X	
#2	"	02A	10		"	X	

Relinquished by: (Signature) Mike SAJADI	Date 11/17	Time 4:30	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Dispatched by: (Signature)	Date	Time	Received for Lab by: (Signature) Denise Harrington	Date 11/21/89	Time 9:50
Method of Shipment:			Lab Comments: Air volumes per M. Sajadi 11-22-89		

*SAMPLE TYPE (SPECIFY): (1) 37 mm 0.8 um MCEF;2) 25 mm 0.8 um MCEF; (3) 25 mm 0.4 um polycarb. filter; (4) PVC filter, diam. ____ pore size ____; (5) Charcoal tube; (6) Silica gel tube (7) Water; (8) Soil; (9) Bulk Sample; (10) Wipe; (11) the

MED-TOX ASSOCIATES, INC.
ANALYTICAL REQUEST/CHAIN OF CUSTODY FORM
(Complete Information on Opposite Side)

CLIENT Thorne Environmental
CLIENT JOB REF.: IE-1066
LAB PROJECT NO: _____ (lab use only)

Date: 11/17/89
SAMPLER(S): MIKE SAJADI

8911133

CLIENT SAMPLE IDENTIFICATION	DATE	Lab Number (lab use only)	AIR VOLUME (Liters)	NO. CONT.	SAMPLE TYPE *	ANALYSES: BTXE/TPH	COMMENTS/ INTERFERENCES
#1	11/16	01A	10		SKC Tube	X	
#2	"	02A	10		"	X	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Mike SAJADI	11/17	430			
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Dispatched by: (Signature)	Date	Time	Received for Lab by: (Signature)	Date	Time
			Denise Harrington	11/21/89	9:30
Method of Shipment:			Lab Comments: Air volumes per M. Sajadi 11-22-89		

*SAMPLE TYPE (SPECIFY): (1) 37 mm 0.8 um MCEF; 2) 25 mm 0.8 um MCEF; (3) 25 mm 0.4 um polycarb. filter; (4) PVC filter, diam. ____ pore size ____; (5) Charcoal tube; (6) Silica gel tube (7) Water; (8) Soil; (9) Bulk Sample; (10) Other (11) Other